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Sustainability challenges of German technology Small and Medium Enterprises - evaluating the influence of sustainability and social value factors on meso level

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Sustainability challenges of German technology Small and Medium Enterprises– evaluating the influence of sustainability and social value factors on meso level

By

Frank Neugebauer

September 2015

A thesis submitted in partial fulfilment of the University's requirements for the Degree of Master of Philosophy

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Abstract

There are more and more obvious problems with sustainability issues in economic, ecologic and social terms. The focus of changing economical ways towards sustainability lies mainly on larger enterprises as well as technical solutions. However, sustainability is important in all areas of life. In order to achieve sustainability all four pillars of sustainability – economical, ecological, culture and social - need to be sustainable and balanced otherwise real sustainability is not achievable. The large enterprises have the largest impacts on social and ecological sustainability due to their size and global actions and trading which is also the reason why the focus is often on LEs. However, the impact of Small and Medium Enterprises (SMEs) is seen from single company perspective, but many SMEs together have a fairly large impact. SMEs are the backbone of Germany's economy and many smaller companies are market leader in specialist fields. According to the "Statistisches Bundesamt" (Federal Statistic Office) 99.3% of all companies in Germany are SMEs where 60% of all employees work (see Table 1).

The export oriented industry in Germany has influences towards and from sustainability worldwide and therefore a wide range of impacts into different countries.

This research evaluated factors influencing Germany SMEs on a Meso-environment level taking the macro- and micro environment and social value into account. In addition, the research understood how German technology SMEs handle sustainability in the context of business and social aspects.

This research took the value and perception of customers and employees into account. Customers can be divided in private and industrial customers. Many German SMEs serve industrial markets and therefore serve mostly industrial customers. The influences of the customers groups are different especially towards SMEs.

The focus is on factors which influence values like education or personal rational choice. These factors play an important part in the culture and politics domain and influence social values and therefore actions of all stakeholders. The problems many German SMEs face is that their stakeholder have a different cultural background since many foreign markets are served. Customer demands and competition in these markets can also avoid sustainability implementation.

This research has been conducted by performing a literature review and collecting data by interviews and questionnaires. In addition, the SMES which refused to take part were evaluated and their internet page researched in order to find reasons in more detail. The

internet pages were searched for engagements in sustainability, CSR and environmental protection measures in order to define the level of engagement in sustainability actions.

This research methods used were Engaged Theory in combination with Circles of Sustainability. This method offered high flexibility and a framework which supports sustainability research. The focus on this method is taken the different sustainability areas as well as practitioners into account.

The findings of this research are that German SMEs are influenced by their customers as well as employees and managers. The underlying rationale is personal rational behaviour/decisions which focuses on the customers benefits without taking the interest of other groups or society in to account. This phenomenon is also known as social dilemma and could be identified as strongest influencing factor, internally (by employees and managers) and externally (customers and other external stakeholders).

The influencing effect of customers is also connected to a speciality of German SMEs: many German SMEs have their main market abroad and these markets are often price sensitive and therefore customer values focusing on price rather than sustainability. Furthermore, all researched German SMEs have no ideas how a sustainable society could look like which is important to set a sustainable vision and mission. This means that long term planning is not followed in German SMEs. The reasons for this are twofold – lack of education in sustainability and the lack to see the needs to implement sustainability.

Education is also verified as an important factor to influence sustainability but is often overwritten by the social dilemma factor. Other factors which were researched were trust, marketing and institutional theory, which play also a vital rule but have less influence towards sustainability in German SMEs. However, missing trust within the company culture is a barrier for innovations and seems to be German SME problem.

The data gained by the evaluation of the internet pages of non-responded SMEs showed the lack of engagement in sustainability and could strengthen the data gained by the interviews and questionnaires.

Finally this research found similarities in the context of social dilemma, between approaches towards sustainability and communism.

This research contributes to knowledge by finding out factors and its connections which influence sustainability in German SMEs. It also pointed out the problems German SMEs face when trying to implement sustainability. Furthermore, this research used a unique and hardly used research methodology: Engaged Theory and Circles of Sustainability. The use of this method adds to the knowledge base of sustainability research.

Table 1: German SMEs – Role in Germany (Statistisches Bundesamt (2012))

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Chapter 1: Introduction

1. Introduction

This chapter discusses the context, outlines the problem, provides the path for the research and states the contributions of the research.

The first section looks into the context of sustainability, SMEs and social values and influencing factors. It also lays the underling rational of this research.

The following sections define Small and Medium Enterprises (SME), discus challenges in sustainability research and create the research questions evaluated form the problems defined and explaining the research design.

1.1 Context, Problem area and Research Focus

Sustainability is the modern keyword of today's society. Since the first definition of sustainability by the Brundland Commission (1987), "meet present needs without compromising the ability of future generations to meet their needs", sustainability is used in many variations and for many purposes like for marketing purposes for real sustainability or only for "greenwashing", or as political strategy or to describe the need to protect the environment (Past (2009), Benjamin (2012)). However, this definition is very broad and does not help to define sustainability in a clear context. Another intriguing definition is from Barter (2011) who said "Sustainable as used here is intended as the opposite of an unsustainable activity. Where an unsustainable activity can be defined as follows: an environmentally unsustainable activity [can be] simply taken to be one which cannot be projected to continue into the future, because of its negative effect either upon the environment or on the human condition of which it is part". This definition is focusing on the environment and its effects on humans and defines sustainability in this context in more details. Going on with the trend providing more detailed definitions and taken a broader view the following definition takes also social sustainability into account: "a society which allows the humans to fulfil their basic needs, find happiness and individual fulfilment without destroying the environment, sacrificing someone's culture or freedom, exhausting natural resources and without a theoretical end of this kind of live over future generations" (Ashman (2011)). This definition takes the society into account as well as basic needs, happiness and fulfilment without forgetting future generations. Basic needs can only be

fulfilled with a sustainable economy and a healthy environment. On the other hand, happiness and self-fulfilment are more connected to cultural and social sustainability. The definition above as well as the definitions listed below show the progress in definitions of sustainability which takes all aspects of sustainability into account.

Further Sustainability definitions:

The most popular definition of sustainability can be traced to a 1987 UN conference. It defined sustainable developments as those that "meet present needs without compromising the ability of future generations to meet their needs" (WCED (1987)).

"Sustainable means using methods, systems and materials that won't deplete resources or harm natural cycles" Rosenbaum (1993).

Sustainability "identifies a concept and attitude in development that looks at a site's natural land, water, and energy resources as integral aspects of the development" Vieira (2009)

"Sustainability integrates natural systems with human patterns and celebrates continuity, uniqueness and place making" Early (1993)

Sustainable developments are those which fulfil present and future needs WCED (1987) while [only] using and not harming renewable resources and unique human-environmental systems of a site: [air], water, land, energy, and human ecology and/or those of other [off-site] sustainable systems Rosenbaum and Vieria (1999)

Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment. Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations. (Perciasepe (2012))

Sustainability is explained and defined using models. Sustainability can be represented as different models where the most common is the three pillars of sustainability: environmental, economic, and social sustainability. In addition, there are other models like “The Egg of sustainability”; “Atkisson’s Pyramid Model”; “Prism of Sustainability”; “Five Pillars of Sustainability” to name just a few (see Table 2; Joshi and Ravindranath et al. (2007), Dubroff and Huggins (2010)).

Banse and Parodi (2012) argued that all the models mentioned above miss out culture. They explained that the culture heritage must be sustained to have a cultural diversity and special moral values and knowledge. Culture defines lifestyle and togetherness within a society and helps to balance the society which is an important factor for social sustainability.

Table 2: Different models of sustainability (Joshi and Ravindranath et al. (2007), Dubroff and Huggins (2010))

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Therefore they have proposed the "Four-Pillar model of sustainability". This research sees this model as the more holistic approach because culture has influence in sustainability in particular to social sustainability. A well-defined culture of heritage can replace or attenuate a consumer culture. A loss of culture often leads to a Western style way of life which is based on possession of goods (Peach (2012)).

Sustainability with its four dynamic pillars is a very complex construct and the complexity of sustainability regardless of the model used leads to Spangenberg (2005) explanation: "Every society can be described as comprising four dimensions, the economic, social, environmental and institutional. Each of them is a complex, dynamic, self-organizing and evolving entity in its own right, making the coupled system one of tremendous complexity. For this system to be sustainable, each of the four subsystems has to maintain its capability to survive and evolve, while the interlinkages of the subsystems must enable a permanent co-evolution". Spangenberg (2005) also argues that policies only focused on short-term success cannot be sustainable except these are part of a plan which has the bigger picture of sustainability in mind. This means that the four pillars of sustainability have not only connections between them but also interlinkages between different dimensions within the pillars and allows co-evolution of all dimensions and describes the dependency on each other. In order to add to the complexity Stock and Burton (2011) said that: "Sustainability is

multiple things and a sub-discipline of multiple disciplines". One can see the complexity of sustainability in this short sentence and also the difficulty to find a way to sustainability.

Finding the way to achieve sustainability in the context of society is a challenge for SMEs but there are models which deal with the relationship to society, like Corporate Social Responsibility (CSR) or Stakeholder theory, but none of them point out why is it for SMEs difficult to be sustainable.

There are many operational methods and sustainability strategies which could work fine but do not work in SMEs which is discussed in chapter 3. The reason for this problem could be because the social value and personal behaviour component is missing or that the current values and lifestyles are either drivers or barriers for sustainability in SMEs. Many question of which the research has found an answers because "SMEs are the backbone" of many countries' economy. The fact is at least 80% of all global enterprises are considered SMEs, having less than 250 employees; SME's constitute 85% of USA business; 99% of the European Union business; over 99% of enterprises in the UK; and SMEs account for at least 70% of the world's production (Moore and Manring (2009)).

Sustainability as defined and explained above needs to "happen" within a society. The following circumscription of sustainability is a good comparison:

„Todays slow, material-intensive economy which is based on fossil energy source resembles a tanker. However, a sailing ship fulfils the mentioned principles on future economy in a virtually artistic manner. Its design permits a mobility based on the nature instead of doing her harm. It needs much less material and energy. Nevertheless, its mobility depends on, beside the wind energy and the design, substantially from the team aboard. Without a general orientation with a compass or other navigation instruments, without self-restriction of the cargo (backpacks) and above all without active work of the people aboard the course cannot be held. "(BUND/ Miserior: Zukunftsfähiges Deutschland, Wuppertal (1996))

This quotation defines in a simplistic manner how a sustainable economy and society could look like. It sees that there are many different factors (for example team, cargo, construction of the ship) which need to interlink and work together in order to achieve sustainability. The sailing ship quoted above is assumed as Small and Medium Enterprises (SME) in this research because small and lightweight and (often) with assumed focus on team work. SMEs are the backbone of the economy in Germany and therefore play an important role for the society.

Therefore social sustainability is important and McKenzie (2004) defines social sustainability as follow: social sustainability is: “a life-enhancing condition within communities and a process within communities that can achieve that condition.” Furthermore, McKenzie sees that all three pillars need to be sustainable on a basic level which means that one pillar cannot be sustainable if another is not sustainable at all and McKenzie showed the dependencies in the form of three concentric spheres where economy and society are depend on an intact environment. McKenzie argued that social sustainability is not treated with the same importance than ecological or economical sustainability because social sustainability is “far more difficult to quantify than economic growth or environmental impact“(McKenzie (2004)). However, in recent times authors like Kinzig and Ehrlich et al. (2013), Heidergott and Scheffelmeier et al. (2013), focus on social sustainability and introduced some quantifiable factors like wellbeing, balanced wealth and resource efficiency. The possibility to measure some factors helps to quantify sustainability but one can argue that these quantifications are subjective and therefore difficult to justify.

If a society should be long-going and successful – sustainability is the key. Others approaches like anarchy or feudalism proved already not being sustainable because, if a society is not balanced social unrest will occur the larger the difference are. The focus of the research is on sustainability challenges and problems in German technology SMEs taking social values and factors into account. Social value is defined as “general guidelines for social conduct” (Mondal (2014) or as “… social capital as well as the subjective aspects of the citizens’ well-being, such as their ability to participate in making decisions that affects them” (Business Dictionary (2015) or as “the additional environmental, social and economic benefits that can be accrued to communities above and beyond the delivery of the service” (Westall (2012)) or “… is a way of thinking about how scarce resources are allocated and used. It involves looking beyond the price of each individual contract and looking at what the collective benefit to a community is when a public body chooses to award a contract” (Cook (2012)). The different definitions are seen from different viewpoints but it can be summarized that social value is the way we decide or behave when we buy something, when we interact with people or groups or how we make decisions. Value tells us what decision or behaviour is good or not good within a society or community. Therefore social value is connected to sustainability because in order to act sustainable, one needs to value sustainability.

Furthermore, following examples of values guide our behaviour: fundamental rights, patriotism, respect for human dignity, rationality, sacrifice, individuality, equality,

democracy. In terms of sustainability value would let us care about the environment; the society and future generation (or not) depending on the values someone has (Mondal (2014)).

Sustainability in different contexts

Sustainability sees a lot of forces coming from the four pillars defined above. These forces are responsible for change in the world and impact sustainability heavily. According to Kury (2012) there are seven forces changing the world on a macro level: population; resource management and environmental degradation; technological innovation and diffusion; information flows; globalisation; conflict; and governance. This observation from the research side lead to the research questions (see chapter 1.2 Research Question) which are not only looking at the seven forces but going further and exploring links between the forces as well as views towards the social values and social value change.

The connections described above and the social value concept has not been explored in German SMEs so far. The forces and explanations of the connections to SMEs are introduced. Finally a discussion of the outcome as well as a view to the links between the different fields of sustainability has been done. Social values changes over time and a value change will be necessary if sustainability will be achieved since buying behaviour and rational decisions are based on value. These value changes will be significant and one can describe necessary value changes as paradigm change especially in the context of consumerism and economic growth.

The above described forces and values influencing economic are described as meso economy or environment in contrast to macro economy. Macro economy defines the performance, structure, behavior, and decision-making of an economy as a whole and micro economy which is described by buying, selling, demand and supply of products and services. From this explanation the definition of meso-environment will be extracted: Meso-environment/economy describes factors which are not based on micro economy (buying and selling, supply and demand) nor on macro economy (aggregate totals of demand) but focusing on measurable ways of describing social behavior or in other word under what structures these forces play out, and how to measure these effects (Shaw (2014)). This is a foundation for researching social influences and factors towards a SMEs but the micro and macro environment still need to be taken into account. The three environments are interrelated and are connected to each other.

1.1.1 The need for a paradigm change

Society is embedded in the environment and society as well as economy is highly depending on the environment. Due to massive industrial activities in the last 200 years, mankind has altered the environment significantly. “Humans have already changed the biosphere substantially, so much so that some argue for recognizing the time in which we live as a new geologic epoch, the Anthropocene. Comparison of the present extent of planetary change with that characterizing past global-scale state shifts, and the enormous global forcing we continue to exert, suggests that another global-scale state shift is highly plausible within decades to centuries, if it has not already been initiated” (Barnosky and Hadly et al. (2012)). There are many warnings from scientist throughout the world but often the statements have only weak evidence or warnings point into a possible future because hard evidence or immediate effects are often not available. Finding real evidence could mean in many cases it is already too late. Whatever, the real state of earth is, that damages are more and more visible and resources are also definitely limited and not endless (Barnosky and Hadly et al. (2012)). Therefore measures need to be taken in consideration to avoid the collapse of the biological system of earth. Our flora and fauna need to be sustained in order to allow life for future generations. A collapse of the biological system will threaten culture, climate and the availability of food. A sustained environment is needed.

Similarly there is critique that climate change is scarified by business and profit power. The problem our society faces is summarized here: “It is our great collective misfortune that the scientific community made its decisive diagnosis of the climate threat at the precise moment when an elite minority was enjoying more unfettered political, cultural, and intellectual power than at any point since the 1920s” (Klein (2015)

Climate change has already caused natural disasters (floods) and actions are urgently needed. In addition, the unbalanced society is also a thread to us and is not sustainable (Klein (2015)). Furthermore, there are several major political problems in the world (EU and Ukraine crisis, ISS) which unbalances society. Therefore sustainability in all four columns is needed to avoid an imbalanced society which is a thread to society and future generations.

The raisings problems of the societies call for a paradigm change towards more sustainable in order to enable a good life for the current as well as future generations.

1.1.2 Focus Range of SMEs researched

The research reiterates that the focus is on technology SMEs in Germany. In addition, size and turnover define a SME. There are generally two different definitions in Europe and Germany as shown in Table 3 and Table 4. Other continents and countries are not considered since they are outside of the scope of this research.

Table 3: SME definition according to European commission (European Union (2007))

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Table 4: SME definition according to IfM-Bonn, Germany (IfM Bonn (2003))

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SMEs according to this research have not more than 250 employees and turnover figures are ignored in the selection process. This research focused on number of employees rather than turnover for several reasons: 1. Easier way of selecting SMEs for this research; 2. The research is more interested in companies with smaller number of employees since this characteristic defines SMEs which have combined function and only one person or small group which runs the company. Larger SMEs start to separate functions and move, in an organizational way, towards larger enterprises.

According to the research knowledge the definitions above are commonly used in the academic and business world, no research that has be found that defines SMEs in a different way (Bliesner and Dreuw et al. (2011), Peterson and Klewitz et al. (2011)).

Sustainability in technology SMEs

Technology SMEs are able to revert to a wealth of technical tools and ideas but lack access to documents and strategies for society and customers. Tools such as Life Cycle Assessment (LCA) and methods like Design for Sustainability focus on internal company practice miss out the role of the customer and the society in a wider context. On the other hand,

approaches focusing on customers miss out important links to the industry and other macro, meso and micro environmental issues. Mádl (2011) said that sustainability covers many scientific areas and offers many definitions and interpretation which makes it nearly impossible to describe all links and possibilities in one document. This is understandable since real sustainability involves many different fields: engineering, marketing, social science, biological science and so on. Even worse is the situation with the role of SMEs in the world of sustainable development. Sustainability in SMEs is defined as follow: Sustainability in SMEs is long term survival without compromising society not being purely profit oriented but focusing on sustainable knowledge gaining. Knowledge is an important resource which is a key factor for sustainability since knowledge leads to innovation and can be traded with exhausting resources of the earth.

Methods and ideas like how to achieve sustainability - for example remanufacturing, cradle-to-cradle and so on will be scrutinised. There are documents (for example Design for Disassembly and the Environment, Harjula at al.1996; Design for Sustainability, Crul and Diehl, 2004; Sustainable Engineering, Cushman-Roisin, 2009; Design for Recycling, Cushman-Roisin 2012) and papers about different approaches written in the academic and business world but suggested methods are not enough to achieve economical, ecological, social and cultural sustainability since these methods focusing in economic and its effects to the environment. Important factor of the other two pillars, social and culture are not addressed in full by these tools.

The focus is on the engineering industry, since many German SMEs are technology based, taking producers of different technical devices into account. Customer demands and behaviours as well as the influence of marketing and advertising on customers are also taken into account.

Factors and values have been defined which show the links between customers, society, industry, culture and politics and will develop solutions how to achieve full and real sustainability with focus in business strategies in SMEs.

Summary

This section defined sustainability and introduced different models used to work with sustainability. This research uses the four pillar model because it introduces the culture pillar. This pillar has significant influence to social values which are important drivers for decisions and opinions.

It also shows that the four pillars interact in a dynamic way which adds to the complexity of sustainability. This complexity makes it difficult to understand and implement sustainability especially in SMEs due to their limited resources. In addition, literature often points towards LEs and does not take the needs of SMEs into account.
Finally the scope of the targeted SMEs has been defined and explained: German SMEs with maximum of 250 employees.

1.2 Research Questions

Based on the context above, the research recaps its interest which is to find out how SMEs react to pressures coming from the macro environment, how to deal with the micro-environment and last but not least how a paradigm change in society changes business of SMEs. It is particular interested in finding factors and values which influence behaviour and reaction of SMEs and entrepreneurs/owners/managers toward sustainability pressure from the social environment.

The two research questions are:

1. **What are the factors and values internal and external which influence the behaviour of the SMEs in the context of sustainability?**
2. **In which way will SMEs implement sustainability in their company, which tools and resources do they use and what are the drivers and barriers taken social values into account?**

Both questions have been answered in different time periods in this research. It looked in the here and now, in the future imagined by entrepreneurs of SMEs and in the context of a model of a future sustainable society.

1.3 Contribution to knowledge

The research contributes to knowledge by researching and analysing factors which influence sustainable behaviour in German SMEs. German SMEs play an important role in Germany.

Germany SMEs are often driver of new technology and are export oriented. The turnover made by exporting to foreign marked was 2012 195.2 M. Euro and 57% of the German SMEs entered the marked with innovation. These are the highest figures within Europe (Bundesministerium für Wirtschaft und Energie (BMWi) (2014).

Study about influencing factors towards German SMEs has not been done so far. It gives new ideas what sustainability is depend on and how sustainability can be implemented into German SMEs. This is a particular challenge since many German SMEs focuses on export market. Therefore, these SMEs face additional external factors which influence sustainability in one or another way. Research about influencing factors towards sustainability in German SMEs has not been done so far which means the outcome of the research is unique and will contribute to knowledge.

Furthermore, this research used fairly new and seldom used research methods: Engaged Theory with Circles of Sustainability. This approach offers a framework which can handle the different dimensions of sustainability and offers the flexibility to research a dynamic and complex system like sustainability.

1.4 Challenges and Issues in Sustainability Research

There are many challenges and problems in sustainability research as shown and summarized in Figure 1. Research in the field of sustainability especially in social terms is challenging and is often described as measuring the immeasurable.

In order to measure the immeasurable several challenges and problems need to be overcome as discussed as follow.

One of the major challenges in sustainability research is encompassing all involved and affected people like researchers, stakeholder or active citizens. Related to the above concept of involvement is who decides what sustainability is and what are the attributes which defines factors (Lang and Wiek et al. (2012), Fahy and Rau (2013)). Sustainability need to be measured which seems to be as difficult as defining sustainability in detail. Another problem which faces sustainability is the timescale and time lag of measures applied. Outcomes of “sustainable measure” may take years or even centuries to give results. On the other hand, other problems in sustainability research are the transdisciplinary of sustainability. This means research in sustainability contains often more than one science

field which makes interaction between the science fields difficult. There will be always winners and losers if new strategies and ways will be gone. It is not known yet who will be the losers and the winners in the sustainability game.

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Figure 1: Challenges of Research in Sustainability (Lang and Wiek et al. (2012), Brandt and Ernst et al. (2013), Fahy and Rau (2013))

Those who think they could lose might prevent implementing sustainability as much as they can which need to be considered in sustainability research. In addition, the interaction between researcher and practitioner can influence results where the underlying rational can be the winner – looser problem (Lang and Wiek et al. (2012), Brandt and Ernst et al. (2013), Fahy and Rau (2013)).

Most researchers use the Brundland definition for sustainability but, unfortunately, this definition is broad and open to many interpretations. In addition, Fahy and Rau (2013) said that “sustainability research has gained huge momentum both in social and natural science”.

This fact needs to be taken into account when doing research in the field of sustainability. Another problem is that sustainability research has to look over multiple generations and need to try to capture trends in human development. This can only be caught with long term research looking at the same target group, household or industry over a longer period of time. Furthermore, there is often a time lag between implementing a measure and the actual outcome (Schaefer and Ohlhorst et al. (2010)).

Another factor is location. Sustainability is a global problem but most sustainability researchers focus on national data rather than international data. Fahy and Rau (2013) argued whilst there are some research attempts covering more than one country, a real global approach do not exists and is maybe not (easily) possible. However, researches use the comparison on different peer groups, by selecting countries with some distinctive differences or similarities.

The challenge shown above makes sustainability research difficult. The factors mentioned above need to be carefully evaluated and considered when developing a research method. It need be clearly stated what sustainability means for the researcher, how to measure sustainability (if required) and how to involve people without having problems with bias. In addition, most researches are local due to resource and time constrains but external influences are always there and can be an important driver or barrier for sustainability. Finally one needs to have in mind that most researches in sustainability cannot be generalised and lack a holistic view which is often not possible.

All the above problems challenge the methodology of every sustainability research especially social-scientific measurements and are summarized in Figure **1**. The most important questions are according to Fahy and Rau (2013) "what to measure, why and how". This research has found out driving factors for or against sustainability, which is the "what". It tries to determine which factors in human behaviour and society are important for sustainability so they can be targeted to drive sustainable development – which is the "why". Finally the "how" has been developed during this chapter.

1.5 Research aim

The aim of the research *is to evaluate the influence of the macro-environment and the micro-environment through the meso environment in terms of social value change in SMEs and looks for influencing factors in context with social values. In addition it shows the understanding and use of sustainability in all business and social aspects in SMEs.*

1.6 Organisation of the thesis and Research Design

The research begins determining the research methodology based on the research questions followed by a critical literature review in order to understand the current work about sustainability. Following literature review research in sustainability was evaluated, data collection was carried out, results presented and analysed. Thus the research methodology is as follows: Formulation of research question; Literature review; Detailed derivation of research instruments; Data collection; Presentation of the results; Data Evaluation; Discussion of the results.

The different elements and steps of this research are represented in different chapters which are listed below:

Chapter 1: Introduction

This chapter introduces sustainability, social value and the need to implement sustainability. It also explains the scope of the research and defines which German SMEs will be researched. In addition, it listed some research challenges in the field of sustainability.

Chapter 2: Research Design

This chapter describes the research methodology used. It defines the different philosophies and methods used for the research. It also looks at data collection and data analysis and gives ideas how data should be treated and analysed.

Chapter 3: Critical Review of Literature about Sustainability and SMEs

This chapter provides a critical review of literature about Sustainability, Social Values, SMEs and the Linkage between them. It contains three sub-chapters: Sustainability - in a social and technology context; related work on Social Value Change towards sustainability; Role of SMEs in the Society.

Section 3.3 Sustainable measures in companies:

This section concentrates on related work on sustainable marketing and approaches towards sustainability providing a critical assessment on literature review. Furthermore the customer's role within the society will be reviewed. The focus lies on exploring factors and connections between sustainability and personal values and perception. It tries to find the

downsides and obstacles in the transition process towards sustainability and relationships and connections between them.
In addition, this section provides a succinct overview of the area in order to more clearly show the gap that is addressed in the thesis.

Chapter 4: Related work on Social Value and Influencing Factors towards sustainability
This chapter focuses on social values, possible and necessary paradigm changes in society taking values and perception into account. It also describes psychological results of human behaviour towards sustainability, driving as well as barriers.

Chapter 5: Outcome and Analysis Literature review
This chapter summarises the finding of chapter 3 and 4 and listed all factors in one table. It also determines the factors researched.

Chapter 6: Results and analysis
This chapter analyses the raw interview data taken from SMEs and looks into the used research tools, where they come from and how they are implemented and used. In addition, it looks to behaviours and response patterns of SMEs as a reaction to this impact on the micro-environment.

Chapter 7: Discussion and Results
The results from chapter 5 and 6 are discussed and further analysed in this chapter. In addition, the Circle of Sustainability in the context of German SMEs is presented.

Chapter 8: Conclusion
The research is critically assessed and its contribution explained. It also answers the research questions. In addition a discussion, summary and recommendation for further work are included.

Chapter 9: Future research recommendations and implantation
This chapter gives an outlook in future research recommendations and discusses possible ways to implement the results of this research.

Chapter 2: Research Methodology

2. Research Methodology

This chapter describes ways of research in sustainability and develops a research methodology. This research found out how German SMEs are dealing with sustainability issues taken internal and external forces and factors as well as social and personal values into account. These factors and their attributes are complex and dynamic and not understood by many people in full. This chapter shows the challenges of sustainability research and offers ways and methods how to perform this research.

2.1 Sustainability Research and Methods

There is awareness of the need to integrate sustainability indicators of different fields of science but this research is mainly looking into factors influencing sustainability and the knowledge of people about sustainability. However, the focus of this research is social science but it also critically reviewed literature of other field of science since these disciplines have also influence on peoples thinking and ideas about sustainability in general.
There are researchers using different point of views like constructivist or realist but many researchers chose methods only for practical reasons. This "technical view" relies on practical thoughts and possibilities rather than on the researchers view towards social research or sustainability. However, separating the researchers view from the methodology used is also an obstacle to find clear methods for social-sustainability research which is also true for ontological and epistemological approaches.
The researchers view will influence the methodical choice as well as expectations and the way of analysing data. The principle behind the research is that humans are influenced by several factors which lead to a sustainable or unsustainable choice. Therefore the idea is, most (all) people have been and will be influenced by many different factors like other people, groups and so on. The view towards human behaviour will also influence the choice of methodology (Fahy and Rau (2013)).
In order to gain data surveys and interviews are planned and performed. These methods are open to bias and therefore measures need to be implemented to avoid bias. The following sections develop the research design and data collection methods and will deal with bias.

2.2 Research Philosophy

The above section summarized some problems and ways which are supposed to be taken into account when determining a research philosophy and selecting a research strategy.

This research has been carried out in a real world setting which means there is a problem-solving view. It also means that the research philosophy and strategy can vary according to external circumstances.

However, the design and methodology of a research follows a certain philosophy. There are four philosophies identified: positivism, realism, interpretivism and pragmatism (Van de Ven, Andrew H. (2007), Saunders and Lewis et al. (2012)). These research philosophies are further explained in Table 5. The description in this table show the different approaches and the focus of each philosophy and one can see which philosophy is suitable for which kind of research approach.

On the other hand, other researchers (DePoy and Gitlin (2011), Graziano and Raulin (2012)) do not focus on a clear definition of the research philosophy and focus more on practical issues. These two opposing opinions, detailed description of a method and a rather open approach, can be considered for a research. A more open approach is worthwhile for research which requires actions to change and unexpected turns.

However, this research followed mainly a critical realism philosophy but has some elements of an interpretivism philosophy too because sustainability has also subjective elements. Critical realism is used for explaining reality taking social interactions and meanings into account and is also used in sustainability research (Myers (2013), Liefting and Sonnenfeld et al. (2014)). Fahy and Rau (2013) added that interpretivism philosophy is the foundation of household research in sustainability.

The focus of the research is to understand behaviour of society from a human point of view, as well from environmental context and therefore could be rated as a critical realism philosophy.

Table 5: Research Philosophies (Saunders and Lewis et al. (2012))

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Another point comes from Saunders and Lewis et al. (2012) who argued that theorizing by definite ‘laws’, as performed by a positivist approach, is not suitable for a complex topic like sustainability and will miss important issues.

The background of critical realism and interpretivism philosophy comes from two intellectual traditions: phenomenology and symbolic interactionism. The first approach denotes to how humans makes sense of the world around us whereas the latter one refers to the interpretation of the world around us which leads to alterations of our own actions and senses (Seuring and Müller (2008), Graziano and Raulin (2012), Saunders and Lewis et al. (2012)). Both views are important for sustainability research but the focus of this research is on human views to the world around them.
The important point for the researcher is seeing the world like the research subjects understanding the world in their view. This approach is suitable for research in organizational behaviour, marketing and human resource management as well as social science (Graziano and Raulin (2012)) and therefore for this research. Human behaviour is in the focus of this research since it influences actions and views towards sustainability.

There are generally three research approaches defined: deductive, inductive and abductive approach or reasoning. A deductive approach is if a research starts with theory and then the theory will be tested. On the other hand, the inductive approach generates a theory from data which were collected before and the abductive approach is when a new or modified theory is developed on the basis of collected data which are exploring a phenomenon and check patterns (DePoy and Gitlin (2011), Graziano and Raulin (2012), Myers (2013)). Myers (2013) also said that inductive reasoning is more open-ended and exploratory. Many researches use a combination of these approaches during the research life which is also valid for sustainability. It is moving from a specific point to a general point and back to another specific point again which we also do in daily life (Graziano and Raulin (2012)). Nevertheless, this research used a combination of inductive and deductive approach which is ideal for researching human behaviours and opinions and, in addition, their views can differ towards the research’s topic sustainability. The inductive and deductive approach in sustainability research helps to follow specific points to a more general point which can help to explain or follow another specific point. These ways of generalising or specifying certain points is particular important in sustainability research in human views which is the goal of

this research. The German SMEs researched are represented by humans who express opinions which are influenced by internal and external factors. Therefore some statements could point to a more general term whereas more general terms could point to specific issues.

Furthermore, it is expected to get new insights in handling of sustainability issues in SMEs which means a new theory can be created after analysing the collected data which has been done within this reserach. In addition, this research is interested in the contexts of decisions and SMEs sustainable strategies, which is the strength of an inductive approach and the outcome is still open since it is not known what the outcome will be. Additionally, there is a part of a deductive approach since there will be some parts in the research where an existing theory (formulated within the literature review) has been tested by the data collected.

According to Newman and Benz (1998) there are two different research paradigms: qualitative and quantitative research. Quantitative data are numbers and mathematical figures which can be analysed using statistics. Reutlinger (2012) added that usually there are large amounts of data which are used to test a theory. Common strategies for this kind of research are experimental and survey strategies. Newman and Benz (1998) went on and argued that these methods should not be seen as a dichotomy but as an interactive continuum. This means both methods can be used in one research and they interact with each other.

Qualitative research is often used with an inductive approach and supports a variety of research characteristics. According to Rajasekar and Philominathan et al. (2013) and Bailey (2014) qualitative research is aiming to get meanings, feelings and describing a situation. They added that qualitative research is looking at the *why* and *how* of decision making. Myers (2013) also said that qualitative research is used to study social and cultural phenomena. The most common used research method in qualitative research is interviews according to Myers (2013). This research is qualitative because the data collected by surveys expresses meanings and opinions rather than numerical expressions. However, surveys could be done in different ways and this research used interviews as well as questionnaires to gain data which express opinions and gives insight of factors which influence human behaviour. This cannot be presented in a quantitative way.

In addition, observation has been used to gain additional data which can either support or weaken data gained from the interviews and questionnaire. The survey methods are further discussed in section “2.4 ”.

Further research methods like Multimethods and mixed methods have been defined (Newman and Benz (1998), Saunders and Lewis et al. (2012)). These methods combine qualitative and quantitative research methods in different ways. This research used mainly qualitative methods but also some quantitative methods like simple statistics for counting phrases and word. There is another method connected to qualitative research: Multimethod Qualitative study (Newman and Benz (1998), Saunders and Lewis et al. (2012)). This method uses different data collections ways like observation, interviews or shadowing. The research used two different methods of collecting data: interviews as the main source of data and questionnaires. According to Myers (2013) questionnaires are not part of qualitative exploratory studies but are used in this research for gaining additional data which may backup the data derived from the interviews. However, the research used Multimethods to collect more relevant data which is also a tool for Fahy and Rau (2013) in sustainability research. They used questionnaires for sustainability research in households. Households are units with one or more people which can be researched by using questionnaires and interviews. The unit idea can also be used for SMEs when interviewing employees or managers.

Finally, there are different natures of research design: exploratory, descriptive or explanatory studies (Saunders and Lewis et al. (2012), Graziano and Raulin (2012), Myers (2013), Graziano and Raulin (2012)). Exploratory studies asks open questions to gain inside in a particular problem, descriptive study describes a particular situation or problem and explanatory studies aims to get a clearer view of the relationships between variables. The research employs Exploratory-descriptive nature of research since it is describing the current situation of sustainability and tries to understand the relationship between sustainability, SMEs and human behaviour. In addition, it looks into the meso-environment which can be seen as a connecting variable between macro- and microenvironment. The meso-environment contains human behaviours, values and influencing factors and the research finds relationships between these factors, based on current knowledge about sustainability. The foundation of the research is mainly descriptive but the research goal is

explanatory. However, these approaches requires further methodology decisions like the research strategies as well as time frames which are explained in the following chapter.

2.3 Strategies, Time Horizon, and Techniques and procedures

There are several research strategies: Experiment; Survey; Archival Research; Case Study; Ethnography; Action Research; Engaged Theory; Narrative Inquiry, Observation. The research used a mixture of survey interviews, and critical analysis (also taken empirical, integrational and categorical analysis into account), (Graziano and Raulin (2012), Myers (2013), Gregbard and Billinghurst (2015)).

A theoretical view to the problem has been developed by performing a literature review. Data was collected via interviews of senior management and employees of technology SMEs in Germany as well as a questionnaire. The literature review data selection contained some case study approaches as well as new theories about SMEs behaviour towards sustainability. Case studies are used to get detailed and in depth data about a particular case which has high value for this research. This kind of data collection could suffer from bias of the researcher but to get information of SMEs in the context of human behaviour and sustainability, case studies are very valuable.

The collected data was used to test some of the theoretical points but also to develop new insights and altering an existing theory.

There are different approaches to analyse collected data which are also useful to create a theory. There is a possibility new theory can be derived from the collected data even if this research is descriptive. Following approaches have been found which deal with data analysis as well as theory building in the context of social science: Grounded Theory and Engaged Theory.

Grounded Theory was created by Glaser and Strauss (2009) who stated that generating a theory is the process of research based on data. They based their Grounded Theory on comparative analyses or study and try to find the generality of facts. The comparative data analysis is based on two different data sets which are compared in order to retrieve and develop a theory. In addition, collecting data is seen as neutral task and has no influences of the results or research outcome. According to Glaser and Strauss (2009) the analysis is a constant “redesigning and reiterating” of a research in order to generate theory. Borgatti

(2010) added that the method of Grounded Theory is to discover variables or categories and their interrelationship which should lead to a theory. This approach is not suitable for this research because of the nature to collect and analyse data in multiple approaches and the fact that data collection cannot be neutral in social science and sustainability.

On the other hand, there is Engaged Theory or scholarship which "is a methodological framework for understanding social complexity" (Gregbard and Billinghurst (2015)). Engaged Theory sees all steps, from data collecting to data analyses already as presumed approaches. Contrary to the Grounded Theory Engaged Theory makes theoretical presuppositions when collection data.

Furthermore, Engaged Theory is seeking to offer practical solutions and implements research stakeholder in the research design. This means, participants, like interviewees, are seen as an important part of the research project who can add to the research by collaboration or negotiation. In addition, Engaged Theory is very suitable for complex social problems by offering flexibility and different data analysis approaches.

The research structure suggested by the Engaged Theory is shown in Figure 2.

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Figure 2: Research Structure – Engaged Theory (Scholarship) (Van de Ven, Andrew H. (2007))

The figure shows the involvement of stakeholders (practitioners) as well as the problem solving approach. It is argued that the Theory Building parts could be also just answering a research question whichever fits best for a research.

Engaged Theory offers different approaches of analysis: Conjunctural, Empirical, Integrational and Categorical Analysis, Critical Analysis, and Circles of Sustainability (Van de Ven, Andrew H. (2007), Gregbard and Billinghurst (2015)).

This research used the Circles of Sustainability as a data analysis approach of the Engaged Theory because "Multiple frames of reference are needed to understand complex reality" (Van de Ven, Andrew H. (2007)). Data analyses are further discussed in detail in section "2.5 ". The practical and engaging nature of the engaged theory together with the theoretical framework of the Circles of Sustainability approach is perfect for this research because it offers the flexibility need and provides a multidisciplinary framework which is essential for research in the field of sustainability.

The chosen Time Horizon is cross-sectional. This means only a snapshot within a given time is taken. This is due to the time constraining of the research.

2.4 Collecting Data

The decisions of the methods of data collection derived from the general nature of the research: social research of a particular phenomenon with some existing data and expected new data and outcomes (human behaviour and meso environment). Therefore mainly qualitative data need to be collected since opinions of humans need to be researched. In order to collect primary data an interview strategy was used. Secondary data was collected by using questionnaires which contained both type of data – qualitative and quantitative. Both approaches will be used and explained in the following sections.

These data collection methods, used in combination, are also part of triangulation. Olsen (2004) explained triangulation as mixing survey data and interviews which is done in this research. In addition, Olsen (2004) pointed also out that the use of quantitative and qualitative research is essential and both approaches should be used as early as possible in every research. Hussein (2009) sees triangulation as a tool to widen the greater understanding of a research but also as a validation tool and can be used in a variety of approaches such as methodological approaches, theoretical perspectives, data sources,

investigators and analysis methods. Hussein (2009) defined five types of triangulation: methodological triangulation, investigator triangulation, theoretical triangulation, analysis triangulation and data triangulation. This research used a mixture of methodological and data triangulation by gaining qualitative and quantitative data in different ways. However, Hussein (2009) also pointed out that triangulation using in research thesis is far more difficult since most researches are one-time projects and have limited resources in both time and budged. This means that many thesis uses only partial triangulation due to constrains.

Data has been sampled according to the time and resource constrains of the research project. A reasonable amount of data was expected by conducting 25 to 30 interviews which means, based on the response rate stated by Goffin (1992) or Steinbacher (2014) which was approximately 18-24%, about 150 SMEs has been selected. Companies have been chosen in a way that they fit in the category defined in section “1.1.2”. The major source of company addresses was two search portals for companies which also allowed determining the industry and the size of the company. In addition, some NGOs where contacted and ask to support this work. These were the IHK (Chamber of Commerce), Bundesverband mittelständige Wirtschaft (Federal Association of SMEs), Ethics in Business (for German and Austrian SMEs).
SMEs were selected from the resulting list randomly aided by software which could display a number randomly within a given range. This avoided some bias.
The companies were only selected by industry (technology SMEs) and size but engagement into sustainability has not been considered. The goal of this research is to research German SMEs regardless of their involvement or knowledge about sustainability to get a realistic picture.

2.4.1 Interviews

Data were collected using semi-structured interviews. The interviews which have been conducted express the research methodology. It contains three parts: current way, future way and future way build on a given scenario. It is expected to gain data which will test existing theories as well as data which can be the foundation of a new theory or a modified theory. In order to avoid bias the interview questions will be checked twice independently. The question were formulated in a way, to get exactly the information the research needed

and to get a throughout view to the problem. The resulting data were mostly qualitative nature and therefore tools to analyse such data have been used.

According to Denscombe (2010) interviews are suitable for fairly complex phenomena which social and business behaviour in context of sustainability certainly is. Denscombe added that interviews are particular helpful when finding out people's opinions as well as feelings and experiences. Semi-structured interviews still have a list of question but it is more flexible, so the researcher can react to the interviewee answers. This is the main reason why using semi-structured interviews, reacting to answers to get the most information out of it (Denscombe (2010), Moreno-Beguerisse (2013)). This is needed to capture a variety of opinions and to react to different statements within the interview.

2.4.2 Questionnaire

In addition to the interviews a questionnaire has been created and used to collect additional supporting data. It has been used for those companies who are not willing to take part of an interview but are willing to fill out a questionnaire. In addition, the questionnaire has been published so also LEs filled out this questionnaire. This data can be used to compare approaches in SMEs and LEs.

According to Denscombe (2010) questionnaires are used to collect straight forward data in a standardized manner. In addition, Denscombe said that usually two types of data are derived from questionnaires: facts and opinions. The goal of the research is to collect mainly opinions and using facts just as a framework.
The questionnaire (see Appendix F - questionnaire) is used to gain additional data but reducing the amount of time used to answer the questions. Therefore only limited data can be derived from the questionnaire. The questionnaire was meant to be for companies which have no time for an interview. In addition, it was used to gain international data to compare the situation in Germany with the rest of the world.

2.5 Analysing Data

This research used an inductive/deductive research approach, therefore data has been collected and the result showed which themes to follow up. Some parts of the research used the data to test existing theory or use the theory as a guide.

The aim of the interviews is to collects meanings about the topic using empirical data (sustainability in SMEs) in order to develop a new theory or change existing theory. The collected data cannot be analysed via complex statistics (for example standard deviation, regression analyses, t-test, ANOVA) whereas some aspects (for example number of certain answers, respond rates) of the collected data can be treated with simple statistics (for example average, percentage share), like percentages of an answer compared to all interviews, in order to support the significance of the data. Furthermore, values and personal perceptions are explored and these cannot be expressed with numbers rather than expressions which are qualitative data.

In order to analyse qualitative data, data need to be subsequently transcribed which means a written document with the wordings of the interviews have been produced. The interview answers were recorded and then transferred into a written document. Some people do not like to be recorded therefore the answers of the interviewee needed to be written down.

In order to analyse these written documents "Content Analysis" and data analysis approaches of the Engaged Theory is used (see Table 6 at page 35).

According to Berg (2001) and Aneshensel (2002) content analyses is an important tool to analyse qualitative data and contains the condensation of data and making data systematically comparable. Berg defines three different approaches: interpretative, social anthropological and collaborative social research approach.

There are approaches to analyse qualitative data like relational analysis (mixture of different analysis methods include content analysis), content analysis, conjunctural analysis which are all recommended for social research (Denscombe (2010), Busch and De Maret et al. (2012), Gregbard and Billinghurst (2015)).

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Figure 3: Circles of Sustainability (Liefting and Sonnenfeld et al. (2014), James and Magee et al. (2014))

However, the complexity and high numbers of levels and domains requires a completely different approach which is an empirical dimension of the Engaged Theory: “Circles of Sustainability”. This model offers four domains which are Economics, Ecology, Politics and Culture (see Figure 3) which are consistent with the four pillars of sustainability. This analysing approach sees all four domains as equal and data analysis need to take all four domains into account. Every domain contains seven subdomains as shown in Figure 3 which are used to categories data.

The domains and its sub-domains are explained as follow:

Economics

The economic domain explains manufacturing, use and management of products and resources. In addition, resources are discussed in the broadest sense of world resources. This domain is divided into following sub-domains: Production and resourcing; Exchange and transfer; Accounting and regulation; Consumption and use; Labour and welfare; Technology and infrastructure; Wealth and Distribution.

Ecology

The ecological domain focuses on nature and the interaction to social realms. It describes human engagement with natures and includes the build-environment. . This domain is divided into following sub-domains: Materials and energy; Water and air; Flora and fauna; Habitat and settlements; Built-form and transport; Embodiment and sustenance; Emission and waste.

Politics

The political domain explains issues with social power and includes public and private governance and social dealings. It covers the important factor of institutional theory. This domain is divided into following sub-domains: Organization and governance; Law and justice; Communication and critique; Representation and negotiation; Security and accord; Dialogue and reconciliation; Ethics and accountability.

Culture

The cultural domain is defined as social meanings. It explains "the practices, discourses, and material expressions". In addition, it covers social value and personal perception as anchored in a society's culture. This domain is divided into following sub-domains: Identity and engagement; Creativity and recreation; Memory and projection; Belief and ideas; Gender and generations; Enquiry and learning; Wellbeing and health.

This data analysing model covers most of the sustainability areas and expresses important factors and is therefore an important tool for analysing sustainable issues. This is important for this research which has a look to German SMEs in the context of sustainability. Many different factors influencing sustainability have been found and the seven domains with its sub-domains helped to categorize the gained data. However, on the downside of this approach is that it is hardly used as a research method and if used in full, a substantial amount of time and resources is needed to use it in full (Liefting and Sonnenfeld et al. (2014), Gregbard and Billinghurst (2015)).

Nevertheless, other data analyses approaches are included or added to the Circle of Sustainability approach. Since the basis of this research are interview texts content analysis

is useful which is also explained as conceptual analysis and relational analysis where in conceptual analysis concepts are chosen and then counted and quantified. On the other hand, relational analysis tries to find meaningful relationships between the concepts (words, phrases) found. The concept of Content Analysis is shown in Table 6 (Denscombe (2010), Busch and De Maret et al. (2012)). The table shows that hidden messages should be found and the focus is on text, word and phrase which is the way of this research.

Table 6: Used approaches of data analyses (Denscombe (2010))

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The coding of the interview is not really suitable for this research due to its narrative form of data and meaning expressed in different ways. In addition, there are strong interlinkages between the different data sets for the different sustainability areas. However, data can be categorized using the "Circles of Sustainability" as a framework. In addition, to the interview data, self-memos of thoughts while writing down the interviews or summaries can also help to analyse data (Saunders and Lewis et al. (2012)).

The memos were also assigned to a category. There are generally two types of categories: Concept driven; Data driven. Concept driven refers to categories. Concept driven categories will be derived in advanced from the literature review whereas data driven categories will be derived from the data collected. The research used a concept driven categories defined by the Circles of Sustainability approach. However, new categories could occur while

analysing data and therefor there is the possibility that data driven categories could occur (Saunders and Lewis et al. (2012)).

The categorized data can be quantified if an advantage can be gained (see above). In addition, the data will be condensed and a conclusion be drawn. Within this process the data has been compared with existing data as well as with self-memos and other data sources to get the best possible conclusion.
The structural data from the interview design (response rate, reason not to take part) are analysed using simple statistics and percentage calculation. A similar approach has been taken for the data gained from the questionnaires. In addition, the data has been crosschecked with the data gained in the interview and used to support or weaken a new or existing theory derived from the interview data.

In order to find out future ideas of the German SMEs towards a sustainable society a research case scenario of a possible sustainable society has been created and used to find out if the interviewee can imagine such a society and if they thought about the final goal of sustainability. This case is also used to test, if German SMEs are planning in advance taken sustainability into account.

2.6 Bias

Science and research is done by humans and humans have values, opinion and expectations. This characteristic could lead to bias at research information to influence participants in one or another way or interpretation of data in different ways.

Pannucci and Wilkins (2010) define bias as “any tendency which prevents unprejudiced consideration of a question”. They added that bias is a systematic error when one tries to encourage a certain outcome. In addition, they listed several kinds of bias and one of them is interviewer bias which is defined by how information is interpreted and recorded. Pannucci and Wilkins (2010) stated the interviewer bias could be avoided by using structured interviews design or checked by a third party. This is not always possible but checking

interview questions even for semi-structured interviews by third party could reduce bias. However, Mullane and Williams (2013) added that the reasons for bias are as follow: the competitive aspects of the profession with difficulties in obtaining funding; pressures for maintaining staff; the desire for career advancement (‘first to publish’ and ‘publish or perish’); and the monetization of science for personal gain. The competitive aspects as well as gaining personal advantages are also valid for university research degrees. Mullane and Williams (2013) categorized bias in three different groups: Bias through ignorance, Bias by design, and Bias by misrepresentation. Ignorance means not taken obvious data into account, design means the research design and misrepresentation means representing found data in a false manner. This research ensures that all data are taken in consideration, that the research design is sound and that all data and findings are represented. However, the opinion and perception of the researcher is also important and could be an important factor for bias.

The opinion of the researcher towards sustainability is as follow:

- Sustainability is important and necessary in order to preserve nature, animals and culture as well as balanced societies
- The market destroys democracy
- Economic growth need to end, no from industry separated financial industry
- Capitalistic society is not balanced
- Family values and friends are more important than materialistic values
- Cannot imagine that sustainability really works since many attributes are similar to the idea of communism which collapsed in 1990

These points are the opinion of the researcher. However, the researcher put his opinion aside as good as possible to analyse data as neutral as possible. Unfortunately bias cannot be 100% avoided but limited.

Bias can also occur when translation of the only in German conducted interviews and questionnaires into the English language. The researcher’s mother tongue is German but has also excellent knowledge in the English language. Therefore, correct translation should be ensured. However, as in many other languages some translation can be done in one or another way and meaning can therefore change. Extra care has been taken to catch the full meaning in German and translated into English. Obviously there is no 100% guarantee that some translation gets biased but it is controlled.

2.7 Research Ethics

This research follows the ethics guidelines of the Coventry University. These guidelines focus on risk to people who are part of the project as well as the risk to the researcher. There should not be any harm to anyone and people who contribute to the research should be treated with respect and should feel comfortable. Furthermore data gained should be confidentially and there should be no way to find out who has taken part on the research. Graziano and Raulin (2012) added that participants need to be informed well about the intended research and their privacy need to be respected. Risk should be carefully assessed and, if possible, reduced as much as possible. This is as much valid for participants as well as the researcher.

This research has sent detailed information about the researcher, the university and the topic of the research to every participant. In addition, it is guaranteed that all information is treated confidential and that all participants could withdraw their involvement at any time without given any reasons.

The ethics application of the Coventry University has been filled out and approved for both data gaining methods, interviews and questionnaire (ethics approval P25997 and P22656, see Appendix C – Ethics approval).

2.8 Discussion and Summary

The research followed following research philosophy and strategies:

Philosophy: interpretivism; Approach: inductive; Research method: mainly qualitative (quantitative supporting data); Research design: exploratory-descriptive; Strategy: Engaged Theory, surveys, content analysis and Circle of sustainability.

The decisions of the points above derived from the general nature of the research: social research of a particular phenomenon with some existing data and expected new data and outcomes which this research is. The research followed mostly the stages defined by Rajasekar and Philominathan et al. (2013): Selection of a research topic; Definition of a

research problem; Literature survey and reference collection; Assessment of current status of the topic chosen; Formulation of hypotheses; Research design; Actual investigation; Data analysis; Interpretation of result; Report.

Research in the field of sustainability is generally difficult due to its dynamic and complex nature. The suggested research methods can be used for this kind of research but extra care need to be taken into account. Sustainability research requires mainly methods with lower constrains in order to grasp the dynamic and complex nature but these methods are prone to bias. Therefore, it is particular important to put measures down which limit bias like triangulation but also involving third parties in checking the survey and interview designs. It is important to design the research from different point of views otherwise the outcome will be heavily biased. The outcome of this research generated a new theory. The underlying methods of this are comparative and content analysis as well as the Circle of Sustainability. However, deductive and inductive methods have been used to falsify or strengthen existing theories or change these theories.

The collected data are just a snapshot of opinions and strategies of managers, employees and companies and can therefore change over time. A similar research approach may collect different data with similar questions that the research knows. This is due to the ever changing field of sustainability.

As with most researches there is no general truth in the outcome since data gained come from a special research group within one country. External influences as well as changing political and social structure could alter the basis of this research significantly.

Chapter 3: Critical review of literature about Sustainability and SMEs

3. Critical Review of Literature about Sustainability and SMEs

This chapter establishes prospects in the concept of sustainability, marketing and social values. It looks at problems and downsides of the sustainability discussion and considers the role of SMEs.

The first section (3.1) explains the difficulties to understand sustainability and discusses problems with sustainability and the barriers found on the way to sustainability. Particular challenges or needs of SMEs are also discussed. The following section (3.2) built on the prior section and discusses the challenges of SMEs to cope with sustainability issues and compare SMEs with LEs in the context of sustainability approaches whereas section 3.3 focuses on SMEs and how they can implement sustainability strategies.

3.1 Sustainability challenges in different contexts

Sustainability has been explained and defined in chapter 1 which lays the foundation for further reviews and explanations.

Sustainability is highly complex and difficult to understand, especially for entrepreneurs in SMEs. The environment, the society and economy are exceedingly complex systems and they are very challenging to analyse because of the ever changing nature and hardly to predict connections between these systems. Therefore it would be a good idea to simplify these systems. Unfortunately, due to the complex matter, simplifying sustainability creates a lot of space for interpretations depending on starting point of the system, rules defined and connections included. These interpretations lead to confusions which often prevent selecting the right measure or influenced people in one or another way. The complexity lays in the four columns of sustainability which are consistent, nested, and intricate systems and which are not independent or separable systems. One of the main drivers of complexity is human behavior and the root causes, taken human values into account need to be explored and understood. However, a certain propensity in values, ecological, economic and social, certain behaviors follow. This idea can also be linked to the “Triple Bottom Line” (TBL) which is a reporting framework for companies and contains the three of the four columns of sustainability: profits (economic), people (social) and the planet (environment) (3Ps) (Spangenberg (2005), Marcus (2012)).

The above idea of TBL creates new problems: how to measure it, especially the people and planet part. TBL suffers the same imperfection than all other approaches to define sustainability – weighting and measuring of environment and society is highly subjective and ideas towards an indexing system (for example Indiana Business Research Center's Innovation Index) are not used in the business world. Because of its subjectivity for example what is a lost wetland worth or a certain animal species, different people and interest groups will have different perception to values and utility regarding economic, ecologic and social sustainability (Slaper (2011)). The "advantages" of TBL could be expressed in one sentence: "Beyond the foundation of measuring sustainability on three fronts—people, planet and profits— the flexibility of the TBL allows organizations to apply the concept in a manner suitable to their specific needs" (Slaper (2011)). But this sentence also defines the weak part of TBL: adapt to specific needs which could mean it is used to strengthen someone's interests and take society and environment for image or marketing reasons into account.

In addition to the complexity of sustainability, there is another gap in the sustainability discussion which is, despite the espoused inclusion of human resources in the domain of sustainability, a considerable ''short shrift'' has been given to organizational influences on the physical and psychological morbidity and mortality of western employees. This "short shrift" includes issues associated with income inequalities, inadequate pay levels, lack of health benefits, dangerous work conditions, and negative impacts of job design, work stress and redundancies. Further identified problems for social sustainability are putting premium prices on basic products (for example food) or the promotion of negative stereotypes within the field of marketing which leads to disempowering of poor people. All these factors cause an imbalanced society and therefore do not support a sustainable society (Slaper (2011)).

In addition, marketing not only segregates poor people form the rest of the society it also influences heavily consumer's decisions, which lead to some of the problems. Society and industry play an important role (see Figure 4) towards social and ecological sustainability (Simola (2012)). Figure 4 shows the connections between the different domains of sustainability and the strong influencing connection between industry and customers which could be also see as the society.

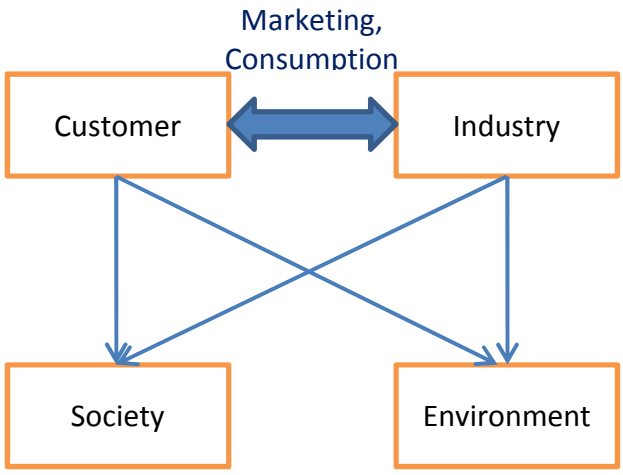

Figure 4: Connections between customers, industry and social and ecological sustainability

Another viewpoint to sustainability issues is environmental awareness. There is an explanation why progress in protecting the environment is deliberate and what is causing the financial crisis in 2008, climate change, lack of resources and depletion of biodiversity: nature forgottenness. This is laid out by philosophers in the 17th century (see “4.2”).
This forgottenness is a difficult to overcome barrier towards sustainability since it is deeply rooted in our values. The nature forgottenness is particular unfortunate since people emerged in nature tend to decide more for the society than only for themselves. It seems that nature can change mood as well as self-awareness which could lead to more sustainable decisions (Poprawa (2012), Müller and Altvater et al. (2012), Zelenski and Dopko et al. (2015)).

Another barrier towards sustainability is the question: who will have profit of a sustainability model. 10% of the world population owns 90% of the capital and mostly this group will profit of this idea which will deepen the difference between rich and poor. This huge difference is another obstacle towards sustainability especial in the context of economic power and political influence. This problem will also occur by selling public assets, but these should be provided by the government without privatising these. If these assets are sold to a private investor, not all people will have access to them because of price increases and the difference between poor and rich people will increase further. In addition, sustainability is connected to an extension of democracy and participation because citizens need to commit to the idea of sustainability via de-centralization and regionalization. Furthermore, the community needs more pluralism and creativity in creating a sustainable lifestyle and society. Therefore, more democracy is needed but the problem is that

democracy will suffer by influence of interest groups which will put their interests over the society. Moreover, the groups with high influencing power (industry, large Non-Government Organisations (NGO), finance organisation) will not give up this power voluntary and ways how to reach such a democracy taken this resistance into account is difficult to describe (Müller and Altvater et al. (2012), anonymous (2013)). The dominate business system can cause globalisation of the local culture („McWorld"), repression of specific cultural properties, and intensification of unbalancing of wealth which can lead to social tensions and unrest. This means the business system has to adapt to the social-cultural system which is necessary to achieve a sustainable development (Albert and Brunner et al. (2001)). However, it is apparent that an economy depending on growth cannot go on endlessly since our world is not infinite but there are no suggestions how a transition to a post-growth society will look like nor any value change in society is taken into account which could support or hinder the transition.

In addition to the above idea of more democracy, especially in the context of SMEs, true democracy is only possible with SMEs due to less political influence (interest groups). Economic development also depends on personal behaviour and society as well as values which was known in the Hellenic system but plays a less important role in the modernity. In addition, very large companies have often too much power and in addition are "too big to fail". On the other hand, SMEs prevent excessive accumulation of power and can therefore support the independence of labour. This means that SMEs can help to balance the political situation in the world where large enterprises and financial institution rule the world and control even governments. Moreover, strong democracies perform better in sustainability than autocracies and semi-democracies. Political and economic structures have high impact on sustainability (Georgantzas and Contogeorgis (2011), Myint and Lambert (2014)). In this context the term discursive power is used to describe the influence of larger enterprises towards customers and society. This power has globally negative effects in implementing sustainable ways (Kolleck (2012)). These ideas have some right views but misses out that many SMEs also focuses on growth which can lead to the creation of an LE. In addition, there are many NGOs where SMEs are organised and these organisations using their power to influence political decisions in their interests.

SMEs may be supporting democracy but this is not enough for sustainability when taken the principle of the transfer of all risk to the economic decision maker into account. This means companies have to be responsible in full for risk taken in nature and society and that the role of companies, especially SMEs within the society will change. These ideas

sound theoretically great but are difficult to implement in reality since the definition of all possible risks and associated costs is a major task. In addition, who should define these risks and costs – it is not feasible and opens doors to avoid particular risks and costs. Furthermore, economic sustainability or a sustainable economy can only be sustainable within a sustainable society if external costs are included in the product costing. Old views to economic sustainability, like reducing the environmental footprint or cutting waste, are not enough to achieve sustainability and a paradigm shift in the business world is needed. It is suggested that ecosystem services need to be quantified which is known as external costs but the difficulties lay in quantification process: what is a particular ecosystem really worth for mankind? However, socially responsible investing (SRI) is as important as the external ecological costs. SRI means companies do their business in a way that society and individuals are not harmed in any way (human rights, unhealthy products like tobacco (Chouinard and Ellison et al. (2011), Koch (2012), Müller and Altvater et al. (2012)).

But as already pointed out above, the difficulties with this approach lays in the way how and who is quantifying the external costs. It will mean that large parts of the society and world need to agree to a value of external costs and risks. However, the responsibility for risks and costs will change or define the environment in which sustainability has to be implemented in a company. This fact pointed the research to the research question 2.

A different approach towards sustainability in an economical context is the wellbeing of society and capital stock (human, man-made, natural and social capital). Wellbeing is difficult to measure and to define but the aim of sustainability should be the wellbeing of the society. Wellbeing is defined by consumption of goods and services as well as other benefits resulting from leisure activities, voluntary work, or social interactions. If wellbeing should be sustainable, should the society focus on consumption or on social interaction? Which side has more power? In order to create wellbeing capital stock is needed to provide products and services. There are two general approaches to capital stock which is weak and strong sustainability. Weak sustainability means capital can be substituted by another form of capital whereas strong sustainability means that every capital and resource needs to be sustained. Nevertheless, there are some difficulties in deciding which resource can be replaced with which resource but it is suggested some substitutions, like “human capital accumulation through educational attainment and skill acquisition can be a substitute for produced capital” (Spangenberg (2005)) which can be helpful. However, the discussion between these two approaches is mainly the degree of substitution with other words which resources can be exhausted and replaced by another one and which not

(Spangenberg (2005), Markulev and Long (2013)). Here lays another problem with different interests of different groups which follow their interests rather than looking at the needs of society. Again sustainability can only be achieved if a majority in society supports real sustainable ideas and this seems not the case taken contemporary conditions into account.

Another significant point when discussing sustainability need to be taken into account: current finance system and the economy of growth. A monetary reform will ease the pressure for growth in the current system because growth requires depth which is disconnected from industry. A post-growth economy is needed because injustice and unequal distribution is not sustainable. In other literature post-growth economy means de-grow. De-growth is also defined as downscaling of consumption and production which leads to human wellbeing and sustains the environment in a sustainable way. In addition, de-growth is a transition state to cool down the overheated economy but not a return to a pre-industrial, communal past. Authors who criticize economic growth and, in particular, GDP point out that GDP does not say anything about growth of social welfare. Moreover, de-growth should lead to a Steady-State Economy and a sustainable society. However, the growth-based economy is based on typical social values – growth and consuming means wellbeing and satisfaction. In addition, many societies and people are longing for maximal profit with less effort. This social paradigm is also mirrored in financial world by extensive speculation without adding any value (Albert and Brunner et al. (2001), Peach (2009), Schneider and Kallis et al. (2010)).

One of the main concerns of sustainability limits is the global ecological crisis: climate change, biodiversity loss, persistent toxic chemicals, dwindling freshwater, particularly the criticality of these problems, their irreversibility, long time lags, and limited predictability and control. Most of the blame has the modern political economy, especially its “shading and distancing of commerce,” the tendency to export environmental threats and escape responsibility for their creation (Princen (2005)). Princen (2005) also explains that “globalization, privatization, and diminishing state capacity conspire with technological innovation and market manipulation to skew the benefits and costs of economic activity, creating the illusion of environmental progress.” The rape of the environment in many South American countries and the ignorance of the wellbeing of local people are fairly common. These people have usually low buying power and therefore not interesting for global firms and governments. The wished changes in material use have failed despite the attempt to implement sustainable development (Princen (2005)). The reasons of this can be found on the one hand in the stakeholder theory, which focuses on special interest groups

weighting the influence towards a business (low power, low impact) and on the other hand of high power interest groups which follow their rational choices only beneficial for that group (see “4.3 Personal and social ”).

Another problem is that Western society is rather unhappy because of unselective material consumption and the condition of buying goods as a social need is created by clever marketing (Kütting (2007)). In return industry excuses the production of these huge amounts of products as follow: “In the market system, consumers are sovereign (in command). Consumer sovereignty is crucial in determining the types and quantities of goods produced. Consumers spend their income on goods they are most willing and able to buy. Through these ‘dollar votes’ they register their wants in the market. If the dollar votes for a certain product are great enough to create a profit, businesses will produce that product and offer it for sale. In contrast, if the dollar votes do not create sufficient revenues to cover costs, businesses will not produce the product. So the consumers are sovereign. They collectively direct resources to industries that are meeting consumer wants and away from industries that are not meeting consumer wants” (McConnell and Brue (2008)). However, consumers do not really know what they should buy because they are lacking in knowledge. There are three dimensions of knowledge limitations: 1) Humans poorly understand ecological systems, 2) Poor understanding of biological systems and there characteristics of providing food and wellbeing, 3) Finally there is hardly any understanding of the limited capacity of the natural system which is changed and exploited by humans (Mencel and Green (2009)). Conversely, no influencing factors for these three dimensions are stated nor why people do or do not want to understand sustainability issues.

Further problems are caused by consumers around the world who want to have the latest fashionable product which makes a sustainable approach not successful. The change in consumer behavior is not easy and need to be addressed by many institutions as marketing departments, education systems, and government and so on. But is it really wanted? Everyone wants economic growth and the more growth we have the more secure we feel. Every year economic growth need to exceed the growth of last year (Hartley (1993)). This results in use of more resources and dumping more unwanted products it is as Davidson (2010) stated “If there are sacrifices to be made, others should make the sacrifices (NIMBY).”

Summary

This overview of the different issues and views towards sustainability should help to understand the main driver of the research: influencing factors to sustainability. The above issues are influencing all further ideas like social value and SMEs within the society and can be seen as an important foundation. However, there are a lot of downsides and gaps in the sustainability discussion as pointed out in the above section and further research is apparent. Common ideas like TBL are often just seen from the company side and have the weakness to be open for different interpretations depending on the interest of the group or person using it. Most of the problems above are caused directly by human behavior which is connected to social values as well as to the society.

3.2 Sustainability and environmental management in SMEs

This section is looking into sustainability and environmental management especially in SMEs and compares SMEs and large enterprises (LE) to find out advantages and disadvantages of SMEs in terms of sustainable management.

There is literature and case studies about sustainability taken into account its multiple dimensions but most of these literatures are written about larger enterprises rather than SMEs and even predict often that a sustainable or environmental strategy is not important for SMEs. This has several reasons: LEs have a larger impact on the environment and have more experience dealing with stakeholder pressure (Shaper (2002), Klewitz and Hansen (2014)). Furthermore, most SMEs have a fairly small impact in terms of waste and pollution if seen as a single company and many SMEs are in the service sector and seen as less “dirty” (Shaper (2002)). On the other hand, del Brío and Junquera (2003) argued that many SMEs are not really interested in sustainability and therefore no demand for appropriate literature. This general statement is not universally true because there are SMEs specialized on sustainable products and solutions and the number is growing.

However, SMEs mostly react to external pressures when implementing sustainable measures (for example regulations) rather than being proactive and take internal drivers into account. The reason for the more reactive ways and strategies of SMEs is that they have less resources and lower economy of scale than large enterprises. In addition, the society observes LEs more closely than SMEs which means environmental strategies have more positive effects in the public than in SMEs. A solution to this problem is also offered -

environmental issues can be addressed by the concept of corporate environmentalism (del Brío and Junquera (2003), Klewitz and Hansen (2014)). Burke and Gaughran (2007) added to the environmental discussion that sustainability needs to be taken into account which addresses all problems.

One of the problems for the lack of literature for SMEs is that they often seen as smaller LEs but SMEs cannot be seen as "smaller large companies". Suggested approaches to achieve sustainability are, partly, significantly different than to larger companies (Seidel and Seidel et al. (2009), Brilius (2010)). Grothe and Marke (2012) argued that the main difference between SMEs and LEs is the entrepreneur of the SME since the entrepreneur has major influence into culture and strategy (see section 4.4). Howarth and Fredericks (2012) added that LEs are different in comparison to SMEs but can take a "mentor" role for SMEs in form of supplier agreements and knowledge exchange. This idea is contradictory to the idea of more localisation and focus of smaller companies rather than larger companies due to their decisive power.

However, the mentor role of an LE to a SME is often anchored in Supply Chain Management (SCM) but is part of the supply chain of larger enterprises. This supports communication as well as the implementation of quality management structures in the SME as well as new technology. This also affects sustainability measures: if the LE requires sustainability action, it will also be implemented in to the SME when part of the supply chain. Many SMEs have no formal supply chain management and take over part of the supply chain management of their main customers if they are larger enterprises. This is often a disadvantage for SMEs because rightly implemented SCM could improve overall performance of an SME (Arend and Wisner (2002), Trung and Belihu (2010)).

On the other hand, it can be argued that high influence of large customer can lead to price and delivery time pressure which can increase over time. This leads to a high dependence on the largest customer which has also high influence into the SME. Large enterprises often make decision which affects their suppliers without communication which can lead to problems in the SME. This also affects sustainability measures: if an LE does not see the necessity of sustainability it is also often supressed by the supplier (von Leitner (2013)).

It can be said that a good supply chain management is an advantage for SMEs but if the largest customers are LEs the supply chain management of the LEs has high influences of the SME. Depending on the culture of the LE this can have positive as well as negative outcomes for the SME. Therefore it is important for SMEs to manage their supply chain and avoid too large influences of their larger customers.

It is obvious that SMEs are different than LEs and the differences are shown in more detail in Table 7 in order to point towards disadvantages and (some) advantages of SMEs (Moore (2005), Brilius (2010)).

The Table 7 also shows that SMEs have significant disadvantages in social issues like CSR or CS (corporate sustainability) and that the interest for sustainability lies mainly in the hand of the owner. This can be a disadvantage and in the same time an advantage because the problem is related to only one person (or a small group of people) ((del Brío and Junquera (2003), Brilius (2010), Howarth and Fredericks (2012), Klewitz and Hansen (2014)). But the owner or entrepreneur is part of the society and therefore influenced by its values which leads to research question 1.

Table 7: Differences between SME and LE (Brilius (2010))

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But there are also advantages SMEs have, as Peterson and Klewitz et al. (2011) pointed out: SMEs have particularly good ways to contribute to sustainability because they have a central role in employment and education, focus their competition and innovation behaviour towards market presents and are passionate to innovate, compensate and speed to compensate disadvantages in size to LEs. Furthermore, SMEs are connected to the local environment and can have major benefits of a sustainable developed region or disadvantages if there is no sustainable development and can play an important part in de-central business structures with short ways and controlled risks. On the contrary, most of the SMEs implementing sustainability in form of a risk management which means only external pressures are taken into account (Peterson and Klewitz et al. (2011), Bliesner and Dreuw et al. (2011)).

When discussing the advantages of SMEs one has to look also to disadvantages SMEs have. One of the disadvantages is that most SMEs have fairly limited resources and often have

cash problems. In addition, mostly external pressure leads to sustainable measures in SMEs and therefore managers see the environment as given and the company has to react to it. Proactive change from within the company in such an environment is not possible (Ates and Bititci (2011)).

Another possible reason for disadvantages could be the low power to influence customers and to follow flavours of the month regarding sustainability. Larger companies take sustainability on for marketing reasons and to improve their image in the society which is less relevant for SMEs. This idea is, so far, not followed by any author.

The above discussed advantages and disadvantages in comparison to LEs can explain some of the problems SMEs face when dealing with sustainability. However, there are other aspects of sustainability in SMEs which need to be discussed.

An important aspect of management in SMEs is entrepreneurship. In this context internal culture, histories and routines are important elements of sustainable entrepreneurship taken the institutional theory into account. These internal elements can determine the way a company reacts to external pressures – merely just to apply to new laws or rules or to implement them into the company's strategy to gain competitive advantage (Spence and Ben et al. (2011)). Table 8 shows the different theories towards entrepreneurship.

Table 8: Theoretical framework of fundaments of SE (Spence and Ben et al. (2011))

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The three theories listed in Table 8 focus on the way how to analyse these theories and which factors are important. It is differentiated between three levels whereas the individual and the organizational level are levels within a company and the contextual level looks at connections and influencing factors outside a company structure. These factors are mainly found in the meso-level for example munificence and the macro-environment. The factors in the table also determine the behaviour of an individual or company towards sustainability (Spence and Ben et al. (2011)). However, a discussion regarding social values can be found in section "4.3 Personal and social Behaviour – factors of social values".

This section looked into differences between SMEs and LEs, described advantages and disadvantages. Looked into management approaches of SMEs and introduced a couple of theories and showed the limits of the different ideas. Important is to take the specialities of SMEs into account and not seeing them as smaller LEs. The differences between LEs and SMEs found have significant influence towards management styles and implementing sustainability into SMEs.

3.3 Sustainable measures in companies

This section discusses sustainable measures in companies in general and into SMEs in particular.

A real sustainable company requires following aspects: innovation and technology; collaboration; continuous process improvement; and sustainability reporting. Sustainable processes and products can only be developed having innovation and latest technology in mind. In addition, sharing knowledge in an industry network and reporting on sustainability issues and achievements will support the transition (Loijos (2012), Klewitz and Hansen (2014). It can be argued that the factors are also useful for rising profit and not supporting sustainability. The different possible ways of use need to be clearer defined by further research.

The strategy for designing sustainable and innovative products and processes which is critiqued here is the product life cycle. In addition, marketing is taken in consideration as an important operation for a sustainable business.

When a sustainable product should be created the whole life cycle need to be taken into account. It is important that the life cycle is in the responsibility of the manufacturer rather than several people or organizations because this avoids responsibility issues. In order to analyse the Life Cycle the International Standardization Organization (ISO) suggested several tools which are known as Life Cycle Assessment. However, not only the tools for designing sustainable products but also the "spinning speed" of the life cycle is important. Extending the life time of the product, which means slowing down the "spinning speed" could be a sustainable strategy (Lefebvre and Lefebvre et al. (2003), Westkamper and Alting et al. (2007)). The life cycle in the context of sustainability as well as different tools and strategies is shown in Figure 5.

One can criticize that the life cycle assessment could be also a tool for profit generation depending of the perception of the user. This is not taken into account by Westkamper and Alting et al. (2007). In addition, the influences of society and environment are not discussed in detail. Another problem is the complexity of a sustainable life cycle assessment which requires resources many SMEs do not have. A LCA for sustainability is a lengthy process since all parts of the life cycle have to be analysed for its sustainability impact. In addition, for each life phase, technical needs, market needs as well as supply chain needs need to be analysed and considered. Therefore, knowledge about technical, strategic, marketing, material and sustainability issues and solutions need to be involved. This is often not possible to do by SMEs.

As already discussed companies should have full control over the life cycle of a product and the green arrow in Figure 5 shows one important tool how to do this: Service. A Product-Service-System (PSS) takes the customer out of the responsibility of using, recycling, and repairing a product and in addition with marketing can a company reach the customer and emphasize on the advantages especially for the customer. This idea is based on the assumption that a company is easier to control and supervise than the customers (Manzini and Vezzoli (2000), Hernández Pardo and Bhamra et al. (2012)).

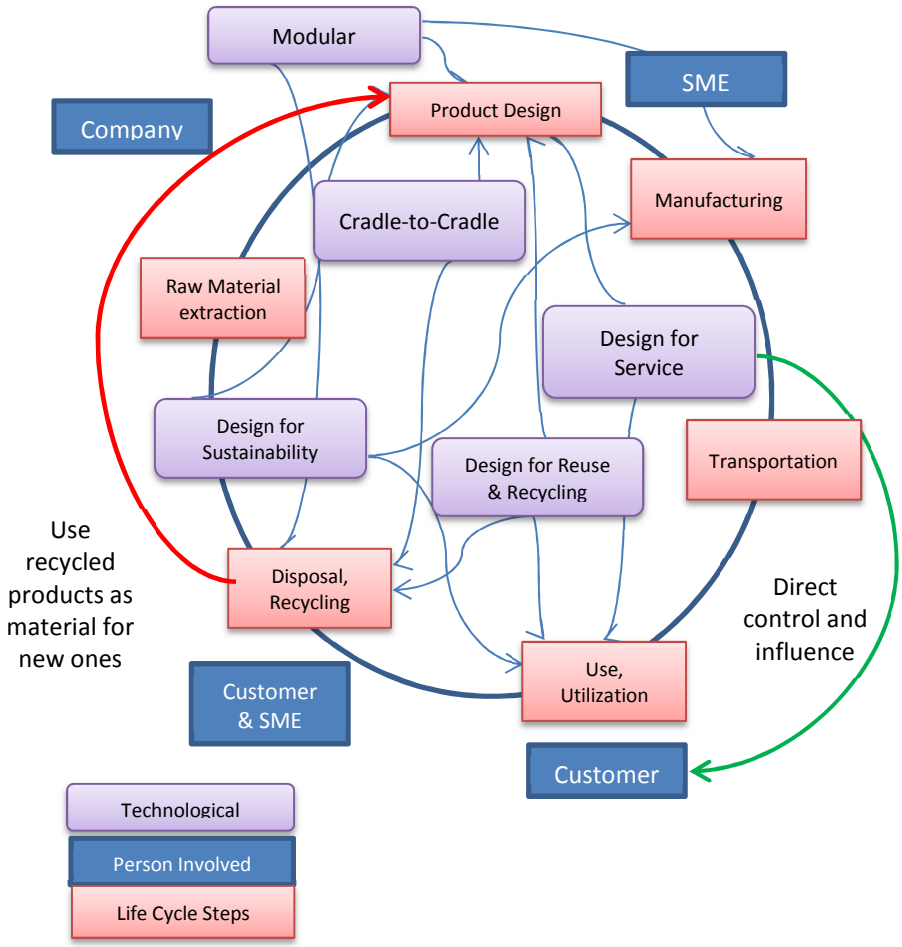

Figure 5: Overview Product Life Cycle in the Context of sustainability

Figure 5 also shows the complexity of the Life Cycle and the tasks and processes involved when dealing with service and product life cycles. SMEs need to be aware of this.

Nevertheless, LCA is not good enough to evaluate a product sustainability impact and needs to be expanded. Usually LCA focuses on technical and environmental models but need to be expanded to include micro-, meso-, and macro-economic models, cultural and political models as well as ethical and societal models in order to see the real sustainable impact.

Such an approach is described as a life cycle sustainability assessment (SLCA) and looks for connection within the different models (Heijungs and Huppes et al. (2009)). Though, this idea sounds fine but it seems hard to be implemented because of the complexity such an approach would have. SMEs are hardly able to run such extensive SLCAs due to resource constraints. However, it could be a foundation for further research.

Another idea regarding life cycle is Cradle-To-Cradle (C2C) which also has sustainability in mind. The idea was developing processes in a way that no waste of any kind is produced

and to create products which can be recycled to 100% and the production process does not generate any waste (Braungard and McDonough (2010)). There are three principles for his idea “Waste Equals Food”, “Use Current Solar Income” and “Celebrate Diversity” and also introduce a Cradle-to-Cradle certification for manufacturer which produces according the Cradle-to-Cradle method. Agreeing with this idea, Kiesewein (2012) said waste is generated by humans and only humans produce waste. This is unthinkable in flora and fauna. In nature everything is recycled – waste of one animal is nutrient of another animal or plants. The aim of cradle-to-cradle principle is to reuse materials.

According to Kiesewein (2012) is not only an ecological but also an economic opportunity. She also said from a technological and scientifically point of view 100% recycling would be possible and it does not need to be expensive. The closed loop idea for products and processes is an important part of C2C which means old not usable products are the starting point of a new product.

Braungard and McDonough (2010) also introduces the idea of technical and biological nutrients which means “waste” will be either reused for a new product or is a nutrient for the natural environment. They also added that “C2C is compatible with continued economic growth”.

The C2C approach sounds generally good but there are many critical points. Reijnders (2008) argues that biological nutrients are not always good and useful waste for the environment. Reijnders (2008) pointed out that some natural substances are hazardous and if large amounts of nutrients dumped in the natural system ecological devastation is highly possible. Reijnders (2008) summarised that biological nutrients are not “ecological irrelevant” and therefore an impact on nature need to be taken into account. Reay and McCool et al. (2011) agreed to this point and added that the idea is too idealistic and usable just for a few special products. In addition, they argued that is hardly possible to have absolutely no waste and that every product life cycle suffers from material degradation.

In addition, Bjørn and Strandesen (2011) argued that C2C is not completely sustainable and can lead to several problems. They argued that the three principles of C2C which are: “Waste Equals Food”, “Use Current Solar Income” and “Celebrate Diversity” have their disadvantages. That is to say in *Waste Equals Food,* they emphasized that there are a lot of materials used which are not recyclable but have other advantages. Example would be composite materials for cars which makes them lighter and in return reduces fuel consumption. On the other hand biological nutrients can change biodiversity by supporting one species better than other ones. In terms of *Use Current Solar Income:* Bjørn and

Strandesen (2011) said as soon as not renewable energy is used there is no 100% C2C product and no 100% sustainability. Moreover, when it comes to *Celebrate Diversity* they added that the main point of this last principle is to avoid one-size-fits-all solutions and instead, design products and systems with local environments, economies and cultures in mind. This means products differ between countries or even regions. The C2C approach has some good ideas but also many negative aspects which need to be addressed. In addition, the "spinning speed" of the life cycle is also not taken into account and as a baseline the C2C idea is too idealistic and has too many gaps in order to be generally useful. C2C has some downsides, that is to say the interaction between company and customer is not taken into account at all. This "interaction" is an operational function in most companies: *Marketing.*

3.3.1 Marketing

Marketing is a very important function in every company; it is the interface to the company's outside world (customers) and defines mostly strategies in companies (Jobber (2010)). On the one side marketing is a tool to gain the knowledge to offer the right product, to the right customer, at the right place at the right time but on the other hand it is also a tool to support massive overconsumption which will lead to sustainable issues (see Brody (2013) – obedience). It was recognised in the 1970's (ecological marketing: Fisk (1974); Henion II and Kinnear (1976)) that marketing need to change and many ideas like green marketing where developed.

There are several definitions about marketing and sustainable marketing. Jones and Suoranta et al. (2013) offer following definition: "…marketing as being concerned with creating, developing, and sustaining exchanges of value between the parties involved."

Marketing was also influenced by the sustainability discussion and new approaches were developed: sustainable, sustainability or green marketing which will be discussed in the following section.

Sustainable marketing is "… marketing within, and supported of, sustainable economic development" (van Dam and Apeldoorn (1996)). There are many attempts to produce and market sustainable products but the attempts often fails since consumer behaviour goes towards buying more products regardless of real needs which is also driven by marketing – a social dilemma (see "4.3 Personal and social Behaviour – factors of social values"). The social dilemma is based on personal rational choice which will lead to damages in society.

This opposing trend has so far withstood most of the sustainable ideas (van Dam and Apeldoorn (1996)). One of the problems is that most researches focus on rational product choice rather than on media influence and "how individuals manage to develop a regular and endless programme of wanting in relation to new goods and services" (Campbell (1987)). Marketing not only advertises products which follow consumption trends they also propagate a materialistic lifestyle. This influences consumer behaviours and even cultures which move towards a materialistic lifestyle. This is based on social and personal values which interact in both ways – from businesses to society and vice versa. This is a part of research question 1 and 2.

The strong influence of social behaviour let many sustainable approaches in 70s and 80s fail including green marketing ideas. Contemporary marketing is caught in our higher, further, faster time and focuses on short term survival and solution rather than to search for the best outcome also in the long run (Belz (2001), Charter and Peattie et al. (2002)).

In this context, marketing is a function and is a normative leading idea within the company's management which means marketing has a dual leading concept. This shows how important marketing is for a company's business strategy. Sustainable marketing is not only essential for business success but also for social and ecological success because contemporary marketing points towards higher consumption which is, in the long run, not sustainable (Belz and Bilharz (2005)).

On the other hand, the role of the customer is very important and the problem in customer behaviour needs to be considered because customers looking mainly for immediate satisfaction rather for long term benefits and pointed also out that marketing can be blamed for constantly creating demand and encouraging customers to buy. Many customers get "greenwashed" which means that green or sustainable behaviour is propagated but not actually done. This is generally a problem in nowadays marketing that many so named "sustainable" products are not really sustainable or have significant hidden trade-offs (see Appendix B - "Greenwashing"Appendix). There is also greater awareness of sustainability of customers but there is a large discrepancy between awareness and actions towards sustainability which means consumer need to get prosumers which are more integrated in the value creating process (Reutlinger (2012), Prymon (2013)). Here lays another challenge for sustainable marketing – influencing customers in the value adding process and product demands towards sustainability as well as influencing social values which lead to the same "interaction" idea of van Dam and Apeldoorn (1996).

Marketing should be also considered within an LCA and needs to put at the beginning of the product life cycle which could help to implement sustainability easier which gives marketing in the context of sustainability a more vital role (Prymon (2013)).

Looking at the above ideas, it is questionable if sustainable marketing is working at all since the main function of marketing is “selling more” and therefore is a tool to influence customers to buy a certain product, regardless if this product is useful for the society or not. In addition, marketing tries to influence value of customers to favourite their product or service rather than having society wellbeing in the long run in mind.

3.3.2 Recommendations to implementing sustainability into SMEs

Implementing sustainability in SMEs is a challenging task but literature suggested tools and strategies which can aid this task. Important is to implement sustainability into the company’s strategy and marketing is, in many companies, an important strategic task.
As discussed in the section above marketing is an important function for every company and defines strategies. Therefore implementing sustainable marketing could be a way forward but it needs to be based on moral decency and regulations (van Dam and Apeldoorn (1996)). In order to do so, staff needs to be involved into sustainable marketing decision which will support trust (Belz (2001)). This means sustainability marketing should be internally driven but also companies need to re-evaluate their products and services and emphasis on the way how they are produced and marketed. This can only be done by the change of education for marketing professionals and the focus on a more holistic way in a sustainable manner. There are tools available which will aid the process of implementing sustainability: Project SIGMA; Sustainable Marketing Knowledge Network (Smart: Know-Net); ISO14001, EMAS and SA8000 (Charter and Peattie et al. (2002), Jones and Clarke-Hill et al. (2007)).
As already discussed in section 3.3.1 there need to be a paradigm change in marketing from simply producing and selling a product to a service approach. Companies should propose solutions rather than hardware for example offers mobility rather than a car. It is also important that the whole life cycle need to be considered and a service approach gives a company more control over the life cycle of a product or service. In addition, the reverse supply chain needs to be taken into consideration within the marketing process in order to achieve sustainability (Charter and Peattie et al. (2002)).

It is not said how this transition to such a business way should be proceeded nor is said how customer behaviour need to be influenced or changed. As long as these issues, which have a major impact on sustainable business (for example possession of goods) sustainable marketing is only wishful thinking.

Life cycle assessment (LCA) as already discussed is an important tool for creating sustainable products but it can also influence marketing since some products will simply fail the assessment and therefore won't be produced even if is there a customer demand. In addition, marketing can help to change consumer behaviour and achieve a sustainable society but it is questionable if marketing, as it is defined today, can solve any sustainability problem at all. If marketing should be helpful for achieving sustainability market segmentation as it is practiced nowadays will not work for sustainable marketing since all customers need to purchase and consume in a sustainable way. This means sustainability in marketing need to be the common factor for all market segments. However, a differentiation between altitudes of customers towards sustainability is useful for defining the right marketing mix for the target customer group (Reutlinger (2012)). An example is the work of the British government's Department for Environmental, Food and Rural Affairs (DEFRA) which divided the UK population in that way. The DEFRA looked into different customer groups in regards of sustainability and defined some target criteria. In addition, they also look at children and the focus of marketing towards them. The recommendation for sustainable marketing depends on which focus groups were addressed and the recommendations differ according to specific needs of a target group.

There are some specialities in SMEs about marketing because many SMEs have only limited knowledge about marketing since there is often no special department for marketing. Furthermore, research on internal weaknesses in SMEs has been done and following problems have been found: "obsolete management, comparatively low profitability, lack of talent among managers, workers lack skills, internal operational problems, delays in research and development, too narrow product range, bad image among customers, poor distribution network, marketing skills below average, no access to finance and to a higher cost" (Rečičár and Tomlain (2013)). Rečičár and Tomlain (2013) also stated that in SMEs is hardly any awareness for sustainable marketing. One could ask what the solutions for the many problems are but they did not offer any solution and did not state any reasons for the problems found.

A different idea is that some SMEs in recent times added Environmental Management Systems (EMS, for example ISO certification) in a very quick manner (Burke and Gaughran (2006), Klewitz and Hansen (2014)). This often means that there are no results towards sustainability because sustainability is not anchored in the company's strategy and culture. This kind of approach does not lead to product- or packaging change for more sustainability. It is important that environmental management is implemented in the business strategy and lived actively.

Another problem of implementing sustainable management structure is the lack of knowledge in SMEs. Therefore, many SMEs seek help at external companies and consultants. It seems that lack of knowledge and education are key factors for implementing sustainability into business (Burke and Gaughran (2006)). Further research is needed here.

On the over hand, there are a lot of opportunities for SME's to develop sustainable practices. There are chances in accelerating cycles of innovations, well developed networks, worldwide connected supply chains and fast changing markets because SME's are usually more flexible and can react faster to change (Moore and Manring (2009)). Conversely, Belz (2001) argued that innovation are overrated and companies should often more focus on existing values and technologies in a more sustainable way.

An important way to gain knowledge and increase marketing capabilities is networking which is particular helpful for SMEs because networks can increase resources (Moore and Manring (2009), Jones and Suoranta et al. (2013)).

There are connections and networks within six markets defined: customer, referral, supplier, influencer, recruitment, and internal markets. These markets are important functions or stakeholders for a company. Networks are seen as connections between several companies which use the network to add different competencies. This is particularly important because SMEs lacks business capability, market impact and other resources (Jones and Suoranta et al. (2013)).

Table 9: Strategic networks for marketing and creation of value (Jones and Suoranta et al. (2013))

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Jones and Suoranta et al. (2013) also stated that the use of social networks is the basis of entrepreneurship and allows entrepreneurs to get an easier access to the market. They defined several important networks as shown in Table 9 like social networks or customer networks. All these networks focus on a particular social or business need and are very important for SMEs since they offer a lot of opportunities. The networking idea supports research question 2 if seen in the context of sustainability rather than only market targeting and profit maximisation. Table 9 also shows the complexity of networks but also the chances especially for SMEs but it is important to consider all possible network connections in order to be successful.

When researching networking between SMEs, a network model has been defined: Strategic Network Marketing Model (SNMM). This model describes the relationships between the different networks listed in Table **9** and the relationship between the connected companies. The model emphasises on the information flow in these networks which influences company's strategy (Jones and Suoranta et al. (2013)).

Networking is essential for SMEs and well networked SMEs are usually more successful than those with no or very small networks. Networks can also play a vital rule for being sustainable in the business world of SMEs but has to be used in the right ways (Jones and Suoranta et al. (2013)). The above described marketing networks need to be broadened to a more holistic approach and take sustainability, knowledge exchange and wellbeing of the society into account.

Another important way to deal with implementing sustainability is change management. Therefore, change needs to be managed from the inside and external sources can support change but internal factors will drive it or not. The term resilience is used to describe a company which uses the sustainable path and is able to manage change. A resilient SME needs to have a culture, open to change and innovation as well as a professional change management in order to achieve sustainability. In addition, resilience can be achieved if the company can make sense of the environment and realign resources faster than the competition. It will lead to competitive advantages and long term success which is a goal of sustainability too (Ates and Bititci (2011)).

Ates and Bititci (2011) did not point out which factors, especial social values and personal perceptions, influence resilience of an SME in the context of sustainability. They also did not say anything about the pre-conditions for a resilient company.

However, the majority of SMEs do not take their visions and values into account when managing change. Ates and Bititci (2011) emphasize that this approach shows a lack of understanding of softer aspects which are human behaviour and attitudes. The idea of resilient SMEs as an important factor to be sustainable leads to research question 1 and 2.

Mbizi and Hove et al. (2013) summarized that the ability of innovation and change going hand in hand and will lead to competitive advantages and the possibility to integrate sustainable management into the company. Furthermore they emphasize that SMEs, due to its size, are usually more flexible and change can be easier implemented. On the other hand small size could be also a disadvantage as discussed in section 4 ().

3.3.3 Sustainability in German SMEs

This section focuses on a case study of Leibniz Information Centre for Economics and University of Applied Sciences Jena, Department of Business Administration, (Buerke (2012)) in order to see specialities regarding sustainability in German SMEs. This case study is used for this research because it explores important internal and external factors influencing management in German SMEs which is also the foundation of sustainability management.

This case study emphases mainly on production SMEs and looked for aspects which are important for SMEs and sustainability as well as CSR. Sixty SMEs took part on this research. This research uses the SME definition of IFM Bonn (see section 1.1.2).
This report looked into six sections which deal with the relationships of SMEs towards sustainability. At first it identified the type of SMEs which are: all-rounder, specialist, differentiator, and innovator. These are typical forms of SMEs in the field of technical production.
Secondly aspects where SMEs see indications to do more for sustainability are listed. These aspects are vital for most companies and are as follow: quality management, cost structure, marketing, controlling, R&D, human resource development, resource efficiency, capital procurement, and globalisation.
In order to find out which activities SMEs already perform these aspects will be more differentiated into business environment and production. Table 10 and 11 show the results.

The tables show in the first column the measures and in the following two columns if the company has performed some activities or not. The last column shows the number of SMEs which answered the questions. Not all SMEs did answer all questions.

Table 10: Sustainability – measures in the business environment (Buerke (2012))

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Table 11: Sustainability – measure in production environment (Buerke (2012))

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As one can see more than 50% of the SMEs are not involved in sustainability tasks. Most of the SMEs try to reduce the use of materials by implementing more efficient processes but the main point of this action is cost saving rather than sustainability. Both tables show that

the majority of SMEs do not implement any sustainable measures or consider sustainability within the production process.

In addition, this report considered also the attitude towards sustainability and the reasons of implementing or not implementing sustainability. If a company has known advantages with implementing sustainability then this will be implemented but often only partly. Here a lack of knowledge can be seen which is twofold: at first many SMEs cannot see advantages for their business and second if advantages are seen it is not fully or not correctly implemented. These reasons for this can be seen in section 3.2 (Sustainability and environmental management in SMEs) again and lies into the lack of involving staff into business decisions properly and the lack of sustainability topics in the general education and qualifications.

Other results of this case study showed what SMEs want to do in the future towards sustainability and which sustainable pillars are important for most of the companies. Not surprisingly in the first aspect companies want to focus on water and energy consumption as well as on material use and the most important sustainability pillar is the economy. Understanding of sustainability lies still in the far future for most German SMEs.

This case study showed valuable data regarding sustainability in SMEs and what SMEs do understand about sustainability. Therefore this case study could contribute to this research by giving some insights into sustainability ideas in German SMEs.

3.4 Summary and Conclusion

This chapter showed the complexity and diversity of sustainability, SMEs and sustainability for SMEs. In addition, it discussed barriers and solutions.

There are many barriers to sustainability identified. One of the barriers is that sustainability is very complex and therefore difficult to understand. If one cannot understand sustainability it will not be or only partly implemented. There are some attempts to simplify the explanations and approaches of sustainability (TBL) but these lead to bias in implementing sustainability or fail at all.

Further barriers connected to lack of knowledge and bias is that social needs and human behaviour is often not or only rudimentary considered. Human behaviour is also influenced by values and these values lack environmental awareness because of nature forgotteness.

Moreover, the winner-loser problem as well as the lack of democracy is identified as important barriers. The latter one is weakened by a dominating business system and the resulting lobbyism.

Another factor identified is that the risk and costs of business action are often externalized. There are suggestions to identify and quantify these risks and costs but the problem is how to quantify and who will quantify these risk and costs. There need to be a global agreement but this is extremely difficult.

In addition, interests groups are identified as a barrier to sustainability which is connected to the stakeholder theory. Companies focus first on these stakeholders with the highest power or interest rather than on social needs which is not sustainable.

Finally, customer behaviour and fashion products are barriers to sustainability since fashion products are not long-lasting and customer demands for such products will force production of fashionable products.

All the above barriers influence sustainability in a negative way and prevent sustainability in different ways. However, there are also approaches suggested to overcome some of the barriers. The first idea is to focus on wellbeing and capital stock. This approach is connected to the idea of strong and weak sustainability. This approach contains also a barrier because the decision if weak or hard sustainability is the way is far away from consensus in the world.

Another suggestion is economic de-growth which means turning away from a growth based economy and financial market. This idea requires major paradigm changes in economy and society and therefore difficult to facilitate.

Finally, the involvement of consumers in the value creating process is suggested. This prosumer idea could be a way forward but requires major changes in society and consumers as well as business behaviour.

The identified solutions are a way forward but require major changes which are always difficult to implement. Often the proposed solutions fail due to human behaviour, lack of knowledge or lack of resources.

After identifying barriers and solutions this chapters also discussed sustainability in connection with SMEs.

One of the problems identified is, that literature about sustainability is mostly focused on larger enterprises rather than SMEs. In this context, it was pointed out that SMEs are different than LEs in many ways. These differences could be disadvantages (lack of

resources) or advantages (flexibility, close connection to social environment). One important factor which has high influences towards a SME's strategy is the entrepreneur or owner of the business. Since SMEs are led by only one person or a small group of people they have significant influences towards the company. This fact has been addressed with the entrepreneurship framework which identified influencing factors like personal perception, economic demand and institutional theory.

However, there are also some solutions for implementing sustainability suggested which do work in SMEs. Suggested tools are LCA for sustainability, Product-Service-System (PSS) or Cradle-to-Cradle. All suggested tools have pros and cons but one issue identified for all approaches is lack of resources and lack of knowledge. In addition to the product focused solutions, ideas towards sustainable marketing could be recognized.

Marketing is for companies a very important function but also supports consumerism. There are some suggested solutions, like sustainable marketing based on good knowledge or the prosumer idea but these approaches are often undermined by greenwashing or focus on sales maximization.

Further suggestions to put sustainability into practice in SMEs are environmental management systems (ISO 14001) which often fail due to lack of commitment and resources, networking to increase resources and knowledge, and change management which is defined as the foundation of implementing sustainability.

Finally, a look towards German SMEs provided that they do not implement sustainability and often lack knowledge.

As seen on the different issues, approaches and solutions common factors are resources, personal perception and knowledge which can drive or hinder sustainability.

However, these factors alone cannot explain why SMEs have either so many difficulties or are not interested in sustainable strategies. There are also factors from the society, employees and customers as already mentioned. The role of customers has shortly discussed in this chapter but a customer has also values, personal perception and is influenced by the society the customer is living in. These factors are discussed in the next chapter.

Chapter 4: Related work on Social Value and Influencing Factors towards sustainability

4. Related work on Social Value and Influencing Factors towards sustainability

This chapter critically reviews and discusses literature which looks at sustainability taken social values, personal perception, society/community itself as well as internal and external factors into account and connects these. As sustainability needs to be performed by humans, technical and strategic issues but also emotional and social issues play an important role in the sustainability game. These emotional and social issues as well as other factors will be discussed in detail here.

Social value has been defined within the context of sustainability in chapter 1. Social values and value change are important factors for achieving sustainability. Profound change, which is triggered by the paradigm of sustainable development, is an impression of changing values in the society. Social value change and changing the paradigm of (sustainable) development cannot be separated and need to be treated together (Albert and Brunner et al. (2001)).Therefore the following sections look at social values, the change of values and their impact on sustainability as well as on business (SMEs).

4.1 Factors influencing strategies

The chapter above discussed some advantages and disadvantages SMEs have to implement sustainable measures and strategies. However, there are several internal as well as external factors which determine and influence environmental strategies at company level. This section will look into internal factors of SMEs and their influence towards sustainability strategies.

The first factors identified are organizational and personal behaviour issues. Furthermore, formal education in the field of environmentalism could play a vital role to implement appropriate strategy in a SME (Schaper (2002)). In addition, following additional factors have been defined which influence the environmental strategy: Financial resources; Organizational structure; Management style; Human resources; Manufacturing activity; Technological approach; Innovative capacity; External cooperation (Alberti and Caini et al. (2000), del Brio and Junquera (2003), Kang (2012), Orth and Kohl (2013), Klewitz and Hansen (2014)). These factors play an important role to identify external influencing factors depending on social values and also gives ideas how SMEs are able to implement a sustainable business strategy. Following the factors will be explained in more detail:

Financial resources

SMEs have generally limited resources which is one of the obstacles to develop an environmental strategy. Burke and Gaughran (2006) added that if large investments in R&D and infrastructures are needed, LE's have definite advantages. Most LE's have incomes from diverse sources which will maximise their ROI. On the other hand more and more investors accept SME's networks, which combine assets and financial strengths. Moreover many SME's are part of a global supply chain and can use opportunities derived from these connections. Orth and Kohl (2013) emphasise on the financial restrictions of SMEs and sees that this as the main obstacle for not implementing sustainable management.

Organizational structure

Implementing of new strategies is easier in well-structured companies like LE but SMEs can usually implement change easier. However, managers are worried to lose flexibility which is not necessarily so because environmental management can make a company more efficient (Alberti and Caini et al. (2000), Orth and Kohl (2013)). Schaper (2002) added that SMEs have a fairly poor awareness of environmental management systems and laws. In addition, it is less likely that SMEs initiate an environmental or sustainability program contrasting LE's or have a written environmental policy.

Nevertheless, del Brío and Junquera (2003) said that most SMEs are less developed than larger companies when it comes to environmental management. On the over hand, Burke and Gaughran (2007) argued that a management change towards sustainability means also a cultural change and this is easier in small companies than in large ones. This change must happen if real sustainability should be achieved.

Another point is that job description and therefore responsibilities are often not clearly defined which can lead to organisational problems and overlapping responsibilities. Most SMEs have an underdeveloped sustainable organisational structure and culture (Seidel and Seidel et al. (2009)). In addition, Ates and Bititci (2011) said that change in SMEs is problematic but the way how change will be managed is a key factor for sustainability and resilience, and depend on organizational structure and management style.

Management style

Literature about leadership styles in SMEs is scarce because it is assumed to be entrepreneurial. However, Schaper (2002) stated that the view point of the owner has a significant influence of the management style and, often, personal views of the owner or top manager do not match the actions within the company, with other words, the personal view of the entrepreneur cannot be found in the actual business practice.

Furthermore, the management style influences the ability of a company to implement changes as well as an environmental strategy. Most managers espouse an agreement with the legislation attitude due to several reasons: lack of information, poor general management, and short-term orientation in decisions and so on. This means that most managers in SMEs miss out on the competitive advantage an environmental strategy could offer (del Brío and Junquera (2003)).

Human resources

Human resources play a vital role in environmental and sustainable management. Employees need certain tacit knowledge in order to implement sustainable behaviour and strategies.

Many employees have hardly any awareness in environmental and sustainable issues within the company. In addition, there is a lack of training offers about environmental and sustainable issues. This means that many SMEs have got no or only a vestigial environmental management system due to employees who are not aware of environmental issues and not trained (del Brío and Junquera (2003)). Mbizi and Hove et al. (2013) agreed to this view and added that many employees are technologically illiterate. This leads to poor relations between operations and other functions.

Another point is that in SMEs are often key human resources concentrate on one person. If this person resigns, major problem not only in sustainability terms, will arise (Kang (2012)). Taken the above statements into account, human resources are an important internal factor which influences sustainability.

Manufacturing activity

Many SMEs have relatively simple manufacturing processes which allow them to adjust ways of action in particularly environmental issues. The simplicity of the manufacturing processes allows a fairly high flexibility which is the foundation for implementing new strategies and ways (del Brío and Junquera (2003)). Forced changes in a more complex

manufacturing environment could be costly. The term environmentally-benign manufacturing has been introduced and many SMEs in Europe have already announced sustainable manufacturing activities. In addition, a number of standard tools like FMEA and Life Cycle Assessments has been suggested to aid manufacturing, and adapted these to sustainable issues in manufacturing (Seidel and Seidel et al. (2009), Klewitz and Hansen (2014)). These statements are only valid for SMEs which manufacture products whereas service companies have to look at their service activities which have also an impact on sustainability.

Technological approach

"The companies with more environmentally advanced approaches require a large amount of resources of a diverse nature" (del Brío and Junquera (2003)). Requiring resources is more difficult for SMEs than for LEs. Therefore, SMEs find it difficult to acquire benefits from green technologies. Seidel and Seidel et al. (2009) and Klewitz and Hansen (2014)) agree to this view and specified the lack of finances and limited human resources as the largest obstacle to follow a green technology approach. Kang (2012) added that some technology factors ("technology; timely innovative technology; technology innovation capability") are key factors for success or failure of SMEs. This is particular true with green technologies since this approach is fairly new. Furthermore, Kang (2012) linked the technological approach of SMEs to their innovative capacity since driver in technology need to have strong R&D.

Innovative capacity

Company size influences the implementation of environmental innovations (Marcus (1984)). del Brío and Junquera (2003) added that larger companies have more likely a R&D department which gives a structural advantage to SMEs. R&D departments are in a good position to do radical innovations and improvements. The lack of structure departments in R&D as well as less centralized information leads to a lack of environmental innovations and do not permit fast reaction to external environmental pressures. On the other hand Mbizi and Hove et al. (2013) pointed out that real innovations also should happen in marketing which means the way how to bring a product or service to the market. They also pointed out that innovation is a key factor to economic growth and there are many factors which support or prevent innovation. It is important to have an open market for investments and to give all

staff the possibility for innovations. This statement aligns with the ideas of chapter 4.3 where communication and culture within a company is rated as an important driver.

External cooperation

It is important for companies to have relations to external pressure groups in order to implement environmental approaches timely and successfully (del Brío and Junquera (2003)). Most literature about external cooperation's is for LEs rather than SMEs. SMEs have less negotiation power than LEs and, therefore, have difficulties with external relations. These difficulties can be an obstacle in implementing environmental management. External partners can have a positive effect on technology innovations and is a strong factor for failure or success of SMEs (Kang (2012)).

When summarizing the above factors which influence implementing environmental management the result is that most SMEs have a poor level of development. In addition, most SMEs do not use environmental issues to create a competitive advantage. There are still clear researches missing why SMEs do not achieve a competitive advantage using environmental management (del Brío and Junquera (2003)). Seidel and Seidel et al. (2009) as well as Kang (2012) emphasized on the linkage of above discussed factors. Most factors are interwoven and depend on each other for example the connection between external partners and innovations. Failure of implementing sustainability is often a failure in the complex interaction of these factors. These interactions and connections as well as influencing factors within the micro-, meso- and macro-environment are not addressed in the literature and this research tries to identify these factors and assess their impact on decisions.

Finally another factor is introduced by Bhamra and Dani et al. (2011): core competency is an important differentiator for competitive advantage. They defined core competency as resources combined with capabilities, knowledge, and culture which leads to unique competitive advantages in the long run. This means that successful sustainable businesses need to have core competencies in the field of sustainability. Core competency is related to innovations, technology and human resources.

4.2 Different Contexts of social value

Mankind faces many problems in terms of sustainability. The current society focuses heavily on economic growth but it is getting more and more apparent that the current way of economy and life is flawed.

Camus (1955) said "*One gets used fast. One wants to earn money in order to live happily. And all efforts and powers are used to get this money. The happiness is forgotten, the way is becoming the self-purpose*."

When looking at values and attitudes towards sustainability, historical ideas need to be considered, since these ideas are often the underlying rational of human behaviour.
One of the problems is that nature is seen as something to use and to control but not to protect some hundred years ago (John Locke, René Descartes, Francis Bacon, Jean-Jacques Rousseau). This was the foundation of the alienation of nature which has been lead to uncontrolled use and destruction of nature and our environment. The movement of knowledge and rationality goes in the same direction and took mankind away from nature rather than seeing both as one unit (Wapner (2008)).
Another historical idea of the European Modernism was the idea of possession of good. This was leading to an obsession to own something. As a result of these ideas a society with the focus on growth and ownership of goods like it is nowadays was created.
These historical ideas influence the current social values heavily as well as how business is mainly done nowadays. There are several social and economic results of these underlying values.

A sustainable society is only with a value change of the society possible, which includes social justice and equation. In addition, a society which is not balanced in distribution of wealth cannot be sustainable and can also lead to social unrest (Albert and Brunner et al. (2001)).
The results of nowadays values like material wellbeing, profit maximization, and consumerism lead to several social and economic problems as stated above. Short term economic and social planning, and focusing on economic growth is one of the problems society has which means time preference for business actions need to be changed. Future sacrifices (either by resource, damages on nature or society or simply by reducing of capital) need to get higher priority in business decisions. Many problems of society are based on

"false" values which are influenced by businesses but there are also influences from the society towards businesses (Albert and Brunner et al. (2001)).

There are other important approaches which can be used to determine factors and internal and external forces: stakeholder theory and Cooperate Social Responsibility (CSR). Both approaches take needs of interest groups or the society from a company perspective into account.

Stakeholder Theory

Sen and Cowley (2012) defined stakeholder as ''any group or individual who can affect or is affected by the achievement of the firm's objectives''. They argued that stakeholder groups have different interests and these need to be taken into consideration of a company's management. There are two different kinds of groups: cooperation and collaboration. Cooperation group is the community which is either affected by or can affect the business and collaboration group supports the business (employees, customers) (Sen and Cowley (2012)). The different stakeholder groups have different interests and each group just considers their interest. This can lead to conflicts between different stakeholder groups and to a dilemma for the company. Stakeholders depend on the firm and on other groups of stakeholders. In the context of stakeholders, there are utilities and value for stakeholders. Four utilities have been defined: "stakeholder utility associated with actual goods and services; stakeholder utility associated with organizational justice; stakeholder utility from affiliation and; stakeholder utility associated with perceived opportunity costs". The focus here is on goods, costs and fairness which can mean different things to different stakeholder groups (Harrison and Wicks (2013)).

The stakeholder theory has important interference points with sustainability especially in the context of value but the different interests of the groups makes it difficult to achieve sustainability without taking the whole society into account.

Corporate Social Responsibility (CSR)

Corporate social responsibility is important for achieving sustainability in SMEs which has also significant impact on the society (Guenther (2008)). Guenther categorizes CSR into four theoretical groups as the stated as follow:

(1) Instrumental Theory: A company understands social actions only as an instrument to achieve economic goals.

(2) Political Theory: A company rules with its power responsible and takes on political rights and duties.
(3) Integrative Theory: The needs of the society will be taken into consideration by the business strategy. The actions for a better society goes above business needs and is seen as advisable by stakeholders
(4) Ethical Theory: A company tries to take part on improvement of the society by doing the right thing. The duty of taken on social responsibility comes from moral reasons.

However, the boundaries of the theory are not clear and overlap which shows the complexity of CSR and missing agreements between actors and it is an ongoing debate (Brilius (2010)).
There are generally two extreme viewpoints towards CSR: finance economical and business ethical view. CSR can be seen on two levels: Micro and Meso level – company, staff, different business levels; Macro level – general orientation, social as a whole level. In addition, stakeholder management is an important part of CSR. "The realization that companies do not operate in a social vacuum but are connected in a variety of ways with the society, leaded necessarily to an of stakeholder management" (Guenther (2008).
Looking at SME's, they are more locally connected, not systematically organized, and CSR or stakeholder management is not embedded in the company's strategy. But as written in the chapter above, SMEs are not in the focus of the public and therefore can hide but interest in SMEs is rising (Guenther (2008), Buerke (2012)).
There a several triggers, defined mainly for LEs but also suitable for SMEs, for implementing CSR into a company: globalisation, human rights, environment, labour and corruption. In addition, there are also some drivers for CSR: civil society, local community, managers, government, investors and consumers, market drivers, and globalization. In some German SMEs CSR plays a vital role but in the majority of companies CSR is more a restricted measure. Ecological, social, and economic success is not possible in the long term without anchoring CSR in the core business. Views towards CSR are mainly national and not international but a global view is needed to achieve sustainability using CSR tools (Buerke (2012)).
Therefore, CSR could play a vital role in implementing sustainability into a firm but has its limitations. As pointed out above, it is often connected to the stakeholder theory and groups with the highest influencing power are taken first into considerations rather than the needs

of the whole society. In addition, CSR is often used to improve the image of a company by focusing on special social projects sold as CSR.

4.3 Personal and social Behaviour – factors of social values

Social values influence also personal behaviour and perceptions and therefore impact business decisions and the way how to handle sustainability. The interaction between social values, personal values and factors influencing business as well as personal values will be discussed in this section.

An important idea in the context of social behaviour is social dilemma which is connected to individual rational behaviour/choice which will lead to damages in society and environment because the idea of this behaviour is to gain maximum short term advantages. This behaviour can cause also individual damages in the long run but individuals are often not able to forecast consequences in the future. In addition, every individual will maximize its profit by externalization of the real costs which will lead sooner or later to the collapse of society due to high accumulated external costs. This dilemma exists on both sides of the market – consumers and companies (van Dam and Apeldoorn (1996), Naderi and Strutton (2015)).

There are several factors which can drive or hinder social dilemmas as discussed as follow:

There are actually rising problems with the social dilemma game since more and more people are narcissists. In the last twenty years narcissism raised by 30% in the US and narcissistic behaviour is usually not supporting sustainability (Naderi and Strutton (2015)).

The social dilemma is also describes as “public goods game”. Abundance or scarcity of resources influences the social dilemma and the personal rational choice. Scarcity of resources often means that cooperation does not happen since personal advantage is the key (Chen and Perc (2014), Mengel (2014)). In addition, social dilemma is also influenced by risk and temptation. These factors influence how decisions are made and need to be taken into account when dealing with personal rational choice in the context with sustainability (Mengel (2014)).

Another factor which supports the social dilemma is disconnecting people from nature. It is suggested connection to nature could influence the social dilemma in a positive way. However, it is apparent that the nowadays consuming societies increases its wealth by more consuming which leads to a collective over consuming which is far away from being

sustainable (Zelenski and Dopko et al. (2015)). Since SMEs are frequently run by an entrepreneur, single person or a small group, SMEs are particular influenced by personal behaviour of the entrepreneur or owner (further information in section "4.4 ").

Another factor is the self-identity and lifestyle of people which can be a driver or a barrier for a sustainable lifestyle. There are causal relationships between the self-identity and lifestyle which are specified as number of contextual factors: interpersonal influences (for example persuasion, modelling); community expectations; advertising; government regulations; other legal and institutional factors (for example contract restrictions on occupants of rental housing); monetary incentives and costs; the physical difficulty of specific actions; capabilities and constraints provided by technology and the built environment (for example building design, availability of bicycle paths, solar energy technology); the availability of public policies to support behaviour (for example curb side recycling programs). Some of those factors can be directly connected to social values like community expectations and interpersonal influences (Shove (2010)).
As one can see there are many influences towards personal behaviour but necessary policy documents have a surprisingly limited set of aims to change sustainable behaviour like certain styles of purchasing (in which `green' is the brand of choice); avoiding waste (turning off the tap when brushing teeth, switching off lights that are not required, recycling rubbish); promoting efficiency by adopting green technology (for instance installing insulation, acquiring more efficient appliances); and occasionally restraint (taking fewer non-business flights, consuming a lower impact diet). Social change need to address personal choice in a sustainable manner but current political tools and policy documents are not the right way. A paradigm chance in politics will be needed to influence personal behaviour in a sustainable way (Shove (2010), Kaufman (2014)).

Individual behaviour is connected to business decisions which mean that corporate decisions are driven by individual behaviours and changing individual behaviour in the society will also change corporate actions towards sustainability. Therefore, there is a demand to emphasize on the need to examine root causes of human behaviour (Marcus (2012).
Another idea in the context of personal behaviour is personal responsibility – we need to learn to take active social responsibility and this is depend on social values and factors which influences these values. A passive approach, which most people have, will not be enough to create a sustainable world where well-being is the most important point in

society. Here a transition of social values to more responsibility and sustainability is needed (anonymous (2013)).

A further factor which influences personal behaviour is the obedience of society to an authority. This behaviour was demonstrated by Milgram's experiment in 1963. Obedience to major business corporation is a major problems and the tool for maintaining this is marketing. In addition, conformity is another reason why people follow the consuming path (Brody (2013)).

In this context the question is: does social value change business or can businesses change social values (which are represented by research question one and two). Many factors which influence personal behaviour have been identified as discussed above. There are also some solutions suggested but how to turn values of a society is not clearly defined or suggested. Personal rational choice as well as social values are major factors when discussing sustainability and therefore need to be always taken into account.

4.4 Influencing Factors towards the entrepreneur (Manager/Founder of SME)

The entrepreneur/manager of SMEs get influences by all above factors and need to handle these factors as well as business needs. Therefore, this section discusses factors which influence entrepreneur's decision towards sustainability and also looks for solutions which support sustainability decisions by the entrepreneur. It also discusses the ideas of sustainable entrepreneurship.

Originally entrepreneurship is the foundation of SMEs when they start out but is generally important for sustainability, social change and economy. The entrepreneur and/or the owner or senior manager gets influenced by a variety of factors.

Sustainable entrepreneurship is defined as a value creating activity which is personally driven and considers social and environmental needs exceeding the start-up of a company (Schaltegger and Wagner (2007)). Another definition of sustainability entrepreneurship is: "utilizing creative destruction so that it becomes the driving force for the establishment of a holistic and sustainable economic–environmental–social system" (Gibbs (2009)). The idea of creative destructions comes from Schumpeter (1934) who defined this idea as "processes and working methods that challenge and overturn conventional methods".

It is not exactly known what a sustainable entrepreneur drives or hinders but markets and compliance to environmental laws and regulations, social and personal values may be an important driver. In addition, sustainable entrepreneurship (SE) is related to Corporate Social Responsibility and entrepreneurs can demonstrate responsible creativity. The connection between CSR and sustainable entrepreneurship lies in the focus to social responsibility. It can be argued that CSR practised in LEs is different in a way that the social responsibility approaches of a sustainable entrepreneur for example CSR is a function of LEs mostly part of marketing. On the other hand, sustainable entrepreneur acts from the society within and the well-being of the society is the key point of his businesses (Gibbs (2009), Spence and Ben et al. (2011)).

Entrepreneurship is closely connected to management and therefore management need to be taken into consideration. Management is defined as "the organization, coordination, and control of the activities of an enterprise in accordance with certain policies and in achievement of clearly defined economic objectives" (Spence and Ben et al. (2011)). Management focus is and were always to have costs-benefits and higher profits. However, value can be created by carrying out Managerial Sustainable Practices (MSP). The big picture of sustainability is often not taken in consideration and if it is taken into consideration it is mostly due to external pressures in management practices not taking sustainability into account. Having said that, MSP cannot be detached from business objectives within the social or environmental field but should have a focus on sustainable development. This way of management will lead to differentiated business strategy which will have sustainability as a core strategy. In addition, MSP can cause advantages over competitors but it needs to be implemented voluntarily in an active way rather in a reactive way responding to external pressures to gain real benefits (Spence and Ben et al. (2011), Roxas and Coetzer (2012)).

Some entrepreneurs are visionary, long-term oriented and disruptive innovators and others are passively alert, harmony-restoring responders to change and all the facets between the both extremes. In this context the Neo-institutional theory is discussed, which sees a firm as an open system and they have to consider the institutional environment in addition to the task and technical environment. The institutional environment has to be seen as external pressures by experts through rules and norms. The institutional environment is defined as "social structures that have attained a high degree of resilience […] and that provide stability and meaning to social life". All companies include SMEs have to respond

to this pressure but often this happens more like superficially (Spence and Ben et al. (2011), Ntim and Soobaroyen (2013)).

A further idea is that sustainable entrepreneurship seeks to describe interactions in the institutional realm with a focus on the macro environment. It derives opportunities from market failures and works towards a more sustainable world. Similarity and the reproduction of organizational actions occur through three institutional isomorphism like imitation of business leaders; reacting to state pressure; following expectation of professional institution (Kury (2012)). Most entrepreneurs are macro focused on a social concerns and the problem is how to gain economically and at the same time, have a positively impact on sustainability in terms of society and environment. One has to look at public policy and how large the impact on entrepreneurship is in order to find suggestions for SMEs. Kury (2012) summarized his findings with the question if entrepreneurs have the potential creating sustainable economies. In addition, maintaining capitalistic logic will ground entrepreneurship in existing institution which will hinder achieving real sustainability.

In many SMEs there have been practices implemented towards CSR in order to address social needs but often the entrepreneur is not aware that these practices can lead to or are a part of sustainability in SMEs. In this context Spence and Ben et al. (2011) recommended building networks to calculate and reduce risks and learn about sustainable practices (see section 3.3.2).

The following paragraph focuses on a case study which looked at sustainable entrepreneurship in different countries. It is particular interesting for this research than factors influencing the behaviour of an entrepreneur are discussed.

Research has been conducted in three countries (Canada, Tunisia, and Cameroon) in order to find out which of the selected SMEs integrate or not integrate sustainable entrepreneurship. Different levels of implication of sustainable entrepreneurship have been defined: the committed; the aware; the indifferent (Spence and Ben et al. (2011)).

According to Spence and Ben et al. (2011) the committed entrepreneur is on an individual, organizational and contextual level very much sustainable but they found some differences between the three countries for example Canadian SMEs strong normative motives whereas Tunisian SMEs are more bounded on a social level. On the other end of the scale is the indifferent entrepreneur which sees sustainability more as the financial survival of its firm. This kind of entrepreneur does not understand the big picture or the ideas of sustainability

and usually blame the macro environment for missing opportunities. Between the committed and the indifferent is the aware entrepreneur who knows about the idea of sustainability but is not able to implement sustainability fully because of lack of knowledge or resources. Spence and Ben et al. (2011) draw their findings into Figure 6 and defined there different shades of the three types of entrepreneurs. This says there are not clear boundaries between the types of entrepreneurs but a number of overlapping chharcteristics which stands for the complexity of human behaviour and sustainability.

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Figure 6: Model of sustainable entrepreneurship (Spence and Ben et al. (2011))

All kind of entrepreneurs are influenced by several factors like the personal will of the entrepreneur; its resources, institutions, governments and society the SME operates in. Therefore sustainable entrepreneurship cannot be explained with one theory alone.

The final outcome of Spence and Ben et al. (2011) research is that in order to understand sustainable entrepreneurship different theories need to be combined, in this case entrepreneurial and neo-institutional theories. As seen above there are many aspects involved in sustainable entrepreneurship and no theory is exclusive. In addition, it is shown that social-cultural specificities can be introduced to the implementation of sustainable practice.

On the other hand the entrepreneurship theory could not explain fully the behaviour of the indifferent entrepreneur. They are more managers focusing on classical business values and have hardly any sustainable orientation. In order to persuade this group of entrepreneurs

external pressure is needed like market or government pressure in order to create sustainable SMEs. Rohani (2013) added to this idea that connection in knowledge gaining are essential and argued that sustainable education as well as entrepreneurship in universities is an important column to achieve sustainability in SMEs and in society in general.
Spence and Ben et al. (2011) does not take social value into account as well as factors represented by society's values but this case study gives good insights in sustainability in the context of SMEs in different countries.

Finally Spence and Ben et al. (2011) went on to say that their case study has limitation especially in the selection of the SMEs as well as the use of the three described theories. More research in this field is therefore necessary and the focus need to be more on joining the different research fields of entrepreneurship. Different behaviours and perceptions of an entrepreneur have been discussed and explored but all of them could not point out what the factors are which influence the different entrepreneur approaches and could not put down connections to social values (Gibbs (2009), Spence and Ben et al. (2011), Kury (2012)).

Another case study, resource efficiency, comes from Bliesner and Dreuw et al. (2011) who researched German SMEs. Their focus can be described as follow:
"Companies who are innovative in resource efficiency have specific conditions in work and trust culture. These are parts of value-oriented and appreciative company culture which allow employees creative space in order to bind them on the company. The result of this culture is a high employment safety which leads to competitive advantages."

Resource efficiency is the combination of the ecological term of resources and the economical term of efficiency which helped to reduce the conflict between ecology and economy. Resources in companies are twofold – tangible assets which are tools, and financial assets, and intangible assets like human ability, knowledge and social connection. Generating more intangible resources is suggested rather than using tangible resources. Knowledge will be a very important resource since it can be used to create a competitive advantage (Bliesner and Dreuw et al. (2011)).
The goal for companies is that the use of energy, water and material need to be reduce but intangible resources should be increased which adds further demands like sharing with employees. Implementing this idea of use of resources is described with the term resource-culture which offers two operation levels: internal level – processes, products or services

and the organization as a whole; external level – customer, suppliers as well as the complete life cycle of a product.

Social values, personal perception and behaviour define how employees as well as the entrepreneur react to resource efficiency and sustainability. One of the issues is Employment safety: a key issue for many employees especially in times where flexibility in the world of work getting more and more important. The tendency to more flexibility leads to less stability and values like trust and responsibility works ethics lose their ability to follow goals in long term.

The above mentioned connections are particularly important because experts see a high potential of growth in resource efficient technologies. On the other hand, potential for resource efficient technologies are not used in full in German SMEs due to not implemented processes and the focus on economic advantages. Moreover, managing resource efficiency does not only lead to economic advantages and ecological gains it also develops intangible resources (human abilities, knowledge, social connections, and cultural practices) if employees get involved in the process (Bliesner and Dreuw et al. (2011)).

There are several boundaries why SMEs do not perform innovative measures: lack of financial, human, and timely resources. In addition, many SMEs fight for survival and do not have sustainable issues in mind. This also causes that many SMEs do not get access to supporting governmental programs and funding (Bliesner and Dreuw et al. (2011)).

However, there are some SMEs which implement resource efficiency or sustainable management but the main reason for this is economically forces. Research in these companies showed that innovations mainly depend on external factors whereas the ability to innovate is depending on internal factors like the companies management culture. Thereby innovations can be divided into incremental innovations which are based on existing products (products, services, business models) and radical innovations which often have revolutionary character. Both forms of innovation are necessary to achieve resource efficiency and sustainability. Unfortunately innovations mean often change which faces often difficulties within a company. Therefore, it is very important that there is a change agent, someone who carries the change and motivates others, in small companies (managers or senior employee) (Bliesner and Dreuw et al. (2011), Klewitz and Hansen (2014)).

Another problem of implement resource efficiency is the lack of formal education. There are just a few offers in colleges and universities lately and “standard” business education lacks often sustainability and resource efficiency topics. This problem is another reason why

many employees do not support change towards resource efficiency – lack of understanding and information.
In addition, boundaries have been identified for the implementation of resource efficiency: the innovation culture – lack of qualification of management and staff which leads to a lack of market information and responsibility; shortcomings of external circumstances – structures and dynamics of capital markets, innovation consultation and supporting structures: effectivity of support programs is often insufficient (Bliesner and Dreuw et al. (2011)).

Another important factor, discussed within Bliesner and Dreuw et al. (2011) research is trust.
Trust is an essential factor in order to implement innovations like sustainability or resource efficiency. During the research six rudiments of trust are identified which are worthwhile for further research: trust as inter-personal variable; management of trust; trust and fairness; trust and involvement; trust within change processes.
The research could not define exactly if trust can be controlled by management techniques but it can be influenced. Also important is the character and viewpoints of the owner of the company which also influences trust. If there is a lack of trust employees are afraid of changes and try to hinder change.
German SME manager are mostly not ready to practice personal respect, fairness and considerations towards their employees. In this context hierarchical companies have a below-standard success of innovations.
As one can see trust in a company is a very important often ignored factor to implement successful innovations – and implementing sustainability and resource efficiencies are innovations.
Bliesner and Dreuw et al. (2011) evaluated the results of the interviews of all participating companies. The most important results will be represented here. In addition, some consultancies were asked the same questions and compared with the answers of the companies. This means an internal view can be compared with an external view.
As the focus of the research is the company culture and its factors the interviews contained many question about this research's topic. An important part of a company's culture is the involvement of the employees into decisions. Table shows the result of the answers of executive managers of SMEs as well as of consultancies.

A significant group of companies see the involvement of employees into the decision process as import but the next question is how often employees are involved. Table shows the results of this question and compare it with views of consultancies.

Table 12: Importance of involvement of employees

Involvement of employees in company's decision processes is…	
Frequency in %	
Very important	30.5
Important	57.6
Not important	11.9
Very un-important	0
Sum	100

Table 13: Regularly involvement of employees in important decisions

Rating	**executive managers**	**consultancy**
	Frequency in %	
Fully applies	7	1
Applies	49	19
Does not apply	35	61
Does not apply at al	9	19
Sum	100	100

The tables above show an astonishing divergence between the importance of involvement of employees stressed by SME managers and actual implementation verified by the views of the consultants. The involvement of employees in Germany is not sufficient even if many managers see the necessity. This could be one of the hurdles to implement resource efficiency or sustainability into the company's culture. Which factors leads to this behaviour could not be explained.

Another important issue is the collaboration between departments and groups of employees. Results interpretation indicates that often there is less efficiently collaboration between employees. According to the research project, working together plays an important part together with the employee involvement in implementing innovation.

In addition to the more soft issues for implementing innovative processes the project looks also how innovation is anchored in SMEs. Table 14 shows the outcome. The table shows that many SMEs see the implementation of innovation processes into the company as

important but a lot of SMEs managers do not act accordingly. Furthermore, the actual implementation has the same problem than the employee involvement: it is seen as important but it is often not done this way. This problem has many SMEs that they know what should be done but it is not done. Most of the reasons are explained above.

Table 14: Roll of anchoring of innovation processes in SME

Manager				
	Frequency %			
	very high	high	low	very low
Definition of innovative goals for products, processes, and services	24.4	55.1	15.9	4.6
Implementing idea management	9.6	39.5	42.1	8.8
Employees are aware of necessity of innovations	17.3	62.4	17.3	3.0
Involvement of employees in determining of innovation goals	8.2	38.8	43.5	9.4
Consultants				
Definition of innovative goals for products, processes, and services	14.0	42.1	40.2	3.7
Implementing idea management	0.9	22.6	61.3	15.1
Employees are aware of necessity of innovations	6.4	44.4	42.7	6.4
Involvement of employees in determining of innovation goals	2.0	13.1	66.7	18.2

Bliesner and Dreuw et al. (2011) showed reasons why SMEs do not implement resource efficiency and sustainable management practice. Those who implement resource efficiency do this for financial reasons. The request to reduce costs is apparent in all SMEs but reducing material cost instead of reducing personnel costs is not so well known or done.

The manager and owner play the most important role in implementing innovations and their personal view influences the company culture heavily. Achieving sustainability in SMEs is more a human problem rather than a technology problem. In addition, there are strong external forces which make it difficult to implement sustainable development. It is to find out which factors and values caused the findings of this research. While Bliesner and Dreuw et al. (2011) pointed out some factors and especially personal values and perceptions

influencing business decisions towards sustainability they missed out social values as an important driver and the connections in both ways between society, business world and the customer or staff. This case study helps again to understand issues regarding sustainability in German SMEs. The large scale of this case study allows deriving valuable and valid data which can be used for this research.

4.4.1 Other influencing Factors of social values

According to this research knowledge there is limited work directly focusing on factors influencing business in the context of social values.
However, some external and internal factors have been defined which influence social entrepreneurship. External Factors are the political and legal environment, lack of knowledge, dominating values in society and internal factors are access to finances, recruitment of professional and well-motivated personnel. Values in the society are one of the external factors but not explained further. Internal factors do not take personal or social values into account (Dobele (2011)).
On the other hand some important social values and influences and dependencies are described by (Posner (2011)). The main point is the personal ego and low values prevent sustainable development whereas good social values drive prosperity. Posner (2011) did not point out any connection to business or how the transition from unsustainable to sustainable values could be
Here is a gap in literature which relates to research question one.

4.5 Sustainable society – transitions to sustainable economy

As the idea and opinions in the above section as well as in chapter 3 suggested, there are several ways to achieve sustainability. This research is interested to answer research question 1 in different contexts and one of them is business in a sustainable society. Therefore, this section will look how a sustainable society could look like and what are the conditions.
There are several economic and social models listed for a sustainable society (Park (2012)):
Equitable Eco-capitalist Globalization Model: This model suggests the creation of "green" jobs in all parts of the industry and regulated international trade. In addition, it focuses on

workers' rights and using renewable energy as well as using fees on financial institutions to pay for the transition. The main idea is that economic growth does not lead to ecological destruction.

Alternative Regionalism Based on the Solidarity Economy Model: This model sees international organizations and institutions as heavily flawed because of a bias towards free trade and capital movement and propose an "alternative regional centres of power based on 'complementarity' and a regional network of solidarity economy" (Park (2012)). In addition, it focuses on more local production rather that global trade.

Nation-state Centric Localization Model: The activists who support this model say that the major problems are overproduction, consumerism and overpopulation and focus on a local economy and community co-op. Exports are only allowed for products which are locally not available.

De-growth Subsistence Economy Model: This model sees similar problems as the model described above. In opposition of the model above, the focus lies on economic de-scaling and political devolution and reject all growth and development strategies. It sees capitalism and market approaches as in-human and not sustainable at all.

Socialist Planning Model: Supporters of this model distance themselves from the planning model former socialistic countries and prefer a coordinate planning model. There are various models for such a planning model but they emphasize that workers, consumers and other affected groups need to be involved in the planning process. This planning process is only for larger economic activities whereas local activities are not included in the planning process. This process takes impacts on society and environment into account.

Anarcho-communist Model: This model is based on a moneyless and stateless cooperative economy. It focuses on workers self-management and ownership of goods to the community. Activists focus on small self-managing communities with direct local democracy.

Eco-socialist Planning Model: Activists of this model are against industrialization and economic growth but lean on the Socialist Planning Model.

All the above mentioned approaches to a sustainable have following attributes in common: More regionalization, less globalization, more democracy, companies fully responsible for risk, much less or no economic growth, use of eco-efficient technologies, focus on communities, personal happiness, close loop economy, no financial economy and cross-border trade (Park (2012), Peach (2012)). Many of the above mentioned approaches to

achieve sustainability are inadequate or have huge unaddressed problems. Economic growth cannot be decoupled from ecological degradation and the cyclic crisis of capitalism is not taken into account in all approaches (as long as they think capitalism need to be preserved). In addition, even eco-globalization will lead to inequities if not controlled in the right way. Localization for all goods and governance is not possible because of resource limits, movement of people and different needs. On the other hand, localization for particular ranges of the society and economy maybe good like local agriculture. Another problem identified is consumerism. Nearly all ideas see the problem of sustainability in overconsumption but Park argues who defines what is too much and what is a basic need. Overconsumption is definitely a problem but the difficulties lay in the definition what is too much and what not. Also the idea of moneyless society and not paying any taxes is not possible since many public services, like education, are based on taxation funding (Park (2012)).

Having the downsides of the suggested models in mind some common areas which need to be addressed when suggesting new social and economic sustainable models have been identified: technology and innovations; Global Inequality; Capitalism; Immigration and Citizenship (Park (2012)).

Figure 7 shows a suggested model of a sustainable society. Here work is divided in industrial work and regional work (see also 6.1)).

Globalization and industrial production is fairly limited and companies need to operate within the boundaries of the sustainable society. There are two closed loop economies – regional and industrial. Localization and globalization are combined, where localization is mainly focused on service and agriculture and globalization focused on technology, knowledge and exchange of scarce resources. In addition, it is suggested linking the finance system to the economic system (Albert and Brunner et al. (2001), Shove (2010), Peach (2012)).

Business in such an environment is very different than business in a growth oriented and economic-focused society since markets for products are local and foreign markets are based on knowledge exchange. However, there are already small scale attempts to put the idea of a sustainable society into place. One example is the “Transition Town Totnes” in the UK which is functioning. The aim of this project is: “explore and develop practical actions that will reduce our carbon emissions and dependence on fossil fuels, and through dong this” and “strengthen the resilience of the communities that make up Totnes and District to

withstand the shocks of peak oil, climate change / chaos and economic crisis" (Transition Town Totnes Ltd (2015)).

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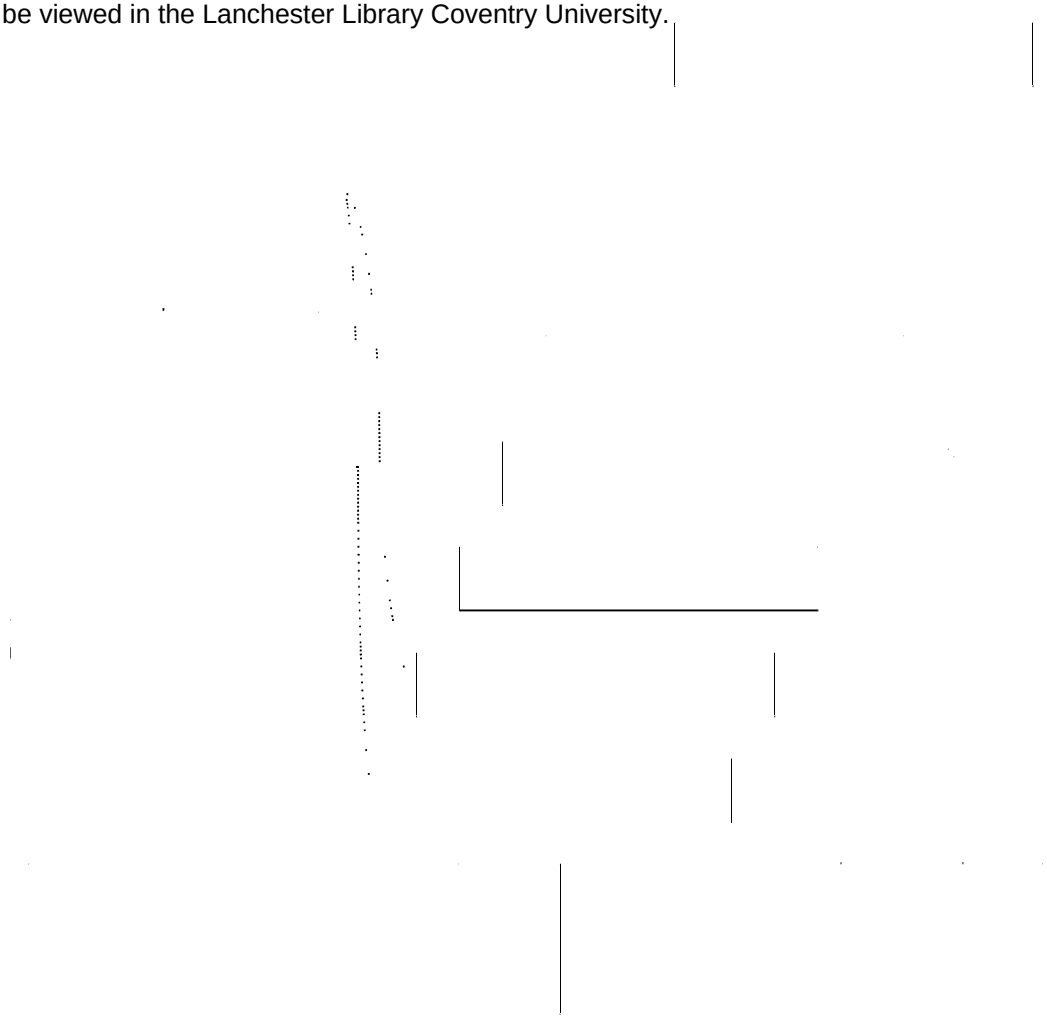

Figure 7: Post-growth society – combined supply chain (Peach (2012))

4.6 Summary and conclusion

In this chapter sustainability is seen from a social values point of view. It has been shown how many different factors can influence sustainability decisions and that one of the major barrier or driver is personal perception and the personal rational choice. Other factors which have been identified are education in sustainability, financial resources, organizational structure, management style, human resources, manufacturing activity, technology approach, innovative capacity and external cooperation. All these factor influence

sustainability in companies. SMEs show a fairly poor level of development when taken all the above factors into account.

Another important factor which influences many other factors could be identified which is social value. Social value has been influenced by historical approaches where the results are still seen today by materialistic lifestyle focused on material well-being and profit maximization. Social value is also connected to personal rational behaviour also known as social dilemma. The social dilemma is a strong barrier towards sustainability and is supported by increasing narcissism, disconnection from nature, false self-identity and obedience to companies. Despite the problems caused by social dilemma only limited policies are available to tackle this problem.

In addition to the research factors, some approaches to influence sustainability on a social level are discussed: stakeholder theory and Cooperate Social Responsibility (CSR). These approaches get influenced by the influencing factor found and are therefore open for misuse. The problem here is the interest group approach which loses focus to the whole society.

All these factors and approaches also influence the entrepreneur or the owners of the SME.

It has been found out that the entrepreneur needs to find his/her way around the many ideas as well as laws and regulations. Literature has developed good ideas about sustainable entrepreneurship, like sustainable entrepreneur, ecopreneur, and social well-being. All of them are influenced by social values, personal perceptions and connection factors and therefore these ideas do not work satisfying.

The influencing factors have also been addressed by two research project discussed within this chapter. The outcome of one project was that entrepreneurial theory alone is not sufficient to explain attitudes towards sustainability. Other theories, like the institutional theory need to be taken into account. The second research focused on German SMEs and pointed out three important factors which have impact on sustainability: employee involvement, trust and innovation capacity. However, the research found out that these factors are poor developed in most German SMEs.

There are ideas on solving sustainability problems by shifting social and economic paradigms. There are also ideas how a society should change for example the idea of sufficiency. It has been argued „… that to adequately deal with growing environmental problems, we need to move from an economy built around the principles of profit maximization and efficiency to that of sufficiency" (Princen (2005)).

Finally in order to answer the research question also within and fully sustainable environment, the idea of a sustainable society has been explored. There are many suggested models but all models have some downsides. A model has been selected which takes most issues into account and focuses on local work and global exchange of ideas and scarce resources.

The research factors influencing sustainability will be further evaluated in the following chapter. In addition, social values and internal factors are compared and summarized.

Chapter 5: Outcome and Analysis Literature Review

5. Outcome and Analysis Literature Review

This chapter merges the findings of chapter 3 (Critical Review of Literature about Sustainability and SMEs) and chapter 4 () compares and present these findings. The focus lies on influencing factors.

There are factors and connection between sustainability and social value which have been researched and reviewed from two different points of view: sustainability and social value. Both approaches have factors in common which are: education and knowledge, personal perception and personal rational choice, institutional theory (laws and regulations), lack of resources (mostly human and finance), and stakeholder theory in connection with personal choice and interest groups. In addition, trust and employee involvement have been identified as an important factor especially in SMEs. These factors have the most influence towards sustainability. However, most of these factors are researched on its own or only with one or another factor. Connections between the factors are only pointed out rudimentary.

Some factors mentioned above have been researched in the context of SMEs but some important connections are missing because some of them are important in relation to LEs or important in relation of personal behaviour and influences.

The above pointed out gaps and factors will be the object of the research which is focusing on the meso-level. The influencing factors and connection found in chapter 3 and 4 are listed in Table 15 which represents this research primary data.

The table shows factors that have been studied individually which influences values and sustainability.

The expected connections and attributes are shown in Figure 8 which takes possible important attributes, connections and factors found in the Literature Review into account. In addition it connects also to the sustainability domains (Circles of Sustainability).

Year and Author	Sustainability Categories	Factors	Connections/Theme
Müller and Altvater et al. (2012), anonymous (2013)	Social	Differences between poor and rich	Leads to imbalanced society and social unrest, threatened social sustainability, connected to income inequalities
Müller and Altvater et al. (2012)	Social	Access to public assets	Access to public access is important for all individuals regardless of wealth – privatisation leads to price rise an unbalanced society
Georgantzas and Contogeorgis (2011), Müller and Altvater et al. (2012)	Social	Understanding of democracy	Democracy is understand as important for social sustainability, large organisation influence democracy to their interest
Princen (2005)	Social, Economy	Globalisation/Localisation	Globalisation leads to unsustainable commerce, local business is not supported
Campbell (1987)	Social, Economy	Media influence/overflow of media inputs	Medial influence buying behaviour – can lead to consumerism and changing of personal values
Spangenberg (2005), Markulev and Long (2013)	Social	Definition of well-being	Social well-being defines a good way of life, highly subjective, connection to personal values and environment
Kolleck (2012)	Economy	Business opportunities and possibilities	Opportunities can be used for non-sustainable business
Shove (2010)	Social, Environment	Built environment	Building design, availability of bicycle paths, solar energy technology – is connected to opportunities and possibilities for individuals
Bliesner and Dreuw et al. (2011)	Economy	Capabilities and constraints provided by technology	Within a company technology can be a driver or barrier – often new technologies are outweigh by a re-bounce effect
Spangenberg (2005), Marcus (2012)	Social	Simplification of sustainability	Sustainability too complex for research, difficult to understand, leads into space for interpretation

Year and Author	Sustainability Categories	Factors	Connections/Theme
Chouinard and Ellison et al. (2011), Müller and Altvater et al. (2012), Barnosky and Hadly et al. (2012)	Social, Environment	Value towards nature, forgottenness of nature	Reason for seeing the nature as resources which need to be controlled, leads to destruction of the environment
Albert and Brunner et al. (2001), Peach (2009), Simola (2012)	Social	Income and distribution inequalities	Imbalances in society, related to differences between poor and rich and access to public assets
Simola (2012)	Economy	Promotion of negative stereotypes	Promotion of negative stereotypes within the field of marketing which leads to dis-empowering of poor people – connection to marketing and media influence
Belz (2001), Kütting (2007), Reutlinger (2012), Prymon (2013)	Economy	Advertisement, Marketing	Marketing is used to support consumerism and influence customers, is used to "greenwash" customers which is often supported by media influence
Dam and Apeldoorn (1996), Shove (2010)	Social	Social dilemma – personal rational choice	Personal rational choice as well as marketing lead to social dilemma – decisions good for a person or a company can have negative impacts on society
Shove (2010), Marcus (2012)	Social	Government regulations, politics	Regulations influence behaviours towards sustainability, politics can be a driver or barrier for sustainability
European Modernism	Social	Possession of goods and attitude towards it	To own goods is good –personal and economy – unsustainable way
Kütting (2007)	Economy, Social	Value of money	Rating of money for personal use or within the society (image etc.), "Dollar votes" for buying products

Year and Author	Sustainability Categories	Factors	Connections/Theme
Peach (2009), Simola (2012)	Social	Status within society and its importance	Status can lead to over-consumption and also takes poorer people out of the society – consumerism and imbalanced society is the result
Albert and Brunner et al. (2001)	Economy, Social	"McWorld" - equalization through global businesses	of the local culture due to dominate business system, destroys social values and focuses on consumption
Dam and Apeldoorn (1996), Burke and Gaughran (2006), Jones and Clarke-Hill et al. (2007) Markulev and Long (2013)	Social	Knowledge and education	Educational attainment and skill acquisition can be a substitute for produced capital, helps to understand sustainability and social needs – imperfect knowledge leads to wrong decisions, important for decision makers in companies to find best sustainable solution
Barnosky and Hadly et al. (2012)	Social	Understanding of ecological and biological systems	The ecological system is hardly understand and the different research outcomes add additional confusion – no action towards protecting the environment
Bliesner and Dreuw et al. (2011)	Social	Trust	Trust is generally important within a company in order to put sustainability ideas forward but influences also general individual behaviour
Shove (2010)	Social	Interpersonal influences	Self-identity and lifestyle of people can be a driver or a barrier for a sustainability
Brody (2013)	Social	Obedience of society to an authority	Obedience to large enterprises or politics can be a barrier for sustainability – connections to marketing and knowledge

Year and Author	Sustainability Categories	Factors	Connections/Theme
Schaper 2002	Economy	Size of a company	Determines working environment as well as business opportunities – influences group values which can be a driver or a barrier towards sustainability
Reutlinger (2012)	Social	Discrepancy between awareness and actions	This is a typical human behaviour which leads passive behaviour towards a problem
Guenther in 2008, Shove (2010), Sen and Cowley (2012)	Social	Interest Groups, community influences	Related to stakeholder theory and CSR, groups have their own dynamic and can support or hinder sustainability, influence towards individuals
Jones and Suoranta et al. (2013)	Social, Economy	Social networking	Social networks can help to anchor businesses in the society, in addition social networks can support sustainable values
Spangenberg (2005), Spence and Ben et al. (2011)	Social	Political and institutional values and stability	Institutional Theory: connected to economic, social, environmental dimensions; social structures that have attained a high degree of resilience and that provide stability and meaning to social life
Neugebauer et al. , in progress	**Social, Economy**	**Factors towards social values and SMEs: political and institutional values and stability, and trust, Knowledge and education, Social dilemma – personal rational choice; Marketing**	**Assumed Connection: not known Actual connection: Research**

Table 15: Factors influencing values and sustainability that have been studied individually

(researched in context of SMEs, not researched in context of SMEs but taken into consideration)

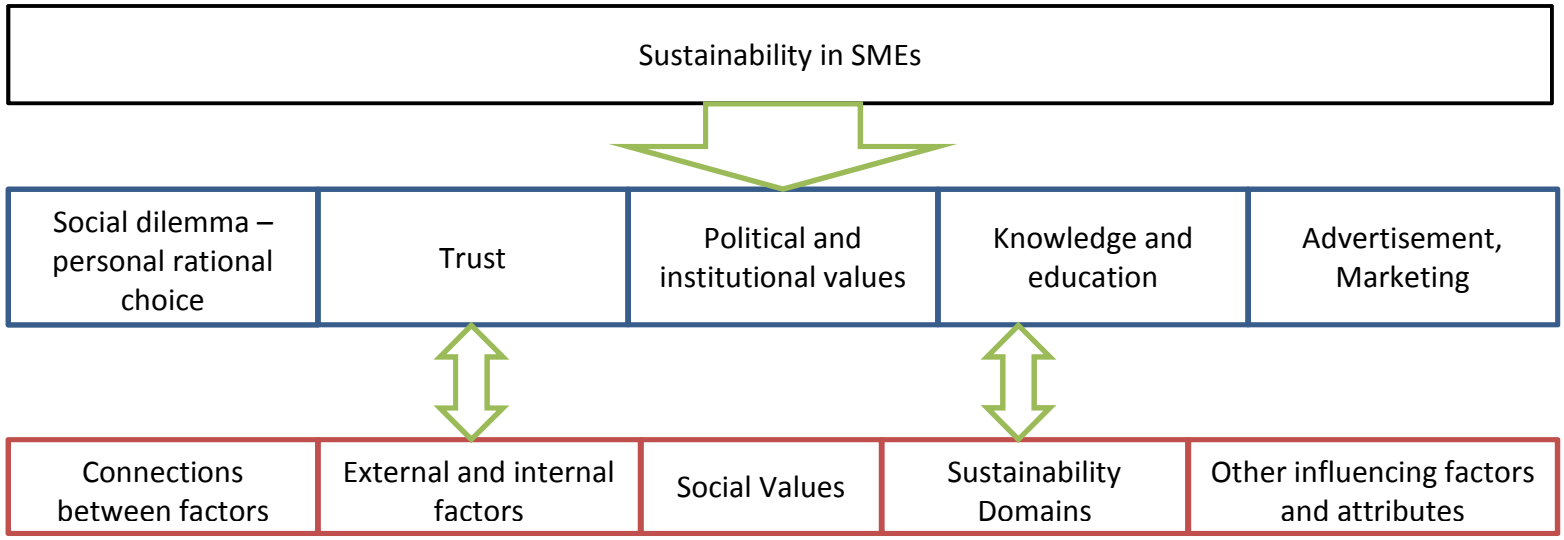

Figure 8: Factors, Social Value and its assumed connections

This chapter looked into the factors as follows: political and institutional values and stability, and trust; Knowledge and education, Social dilemma – personal rational choice; Marketing. These factors have been explored in different context but not their connection to each other and not the influences towards social values and German SMEs in the context of sustainability. Completely missing are the connections between these factors and the connection towards a German technology SME implementing sustainability.

Conclusion and Summary

According the research knowledge no model has looked at the factors mentioned above and explored its connection between them as well as towards German SMEs and the transition to sustainability in SMEs.

This research found out which factors influence which value and which ones are relevant of implementing sustainability into SMEs and looks into its connections. It shows how important social and personal values are and which factors, and therefore which tools and approaches, can influence value into a sustainable way.

In addition, the implementation of sustainability, taken typical tools and strategies into account, has been researched.

The data prepared in this chapter derived from literature review need to be compared and evaluated with further data. Data has been collected by conducting interviews and questionnaires with German SMEs. These data is presented in the following chapter.

Chapter 6: Results and Data Analyses

6. Results and Data Analysis

This chapter presents and analyses further primary data in addition to the data presented in Table 15 in chapter 5. This research uses triangulation as a validation measure and, therefore, data needed to be collected from two further sources.

Data collection was done via a semi-structure interview which is structured in three parts (see) as well as a questionnaire (see). The first part of the interview looked at the situation now; the second part the possible situation in the future, the third part looked at the situation considering a real sustainable society is in place. The real sustainable society was created as scenario in the following chapter.

The interview and questionnaires data are used to answer the research questions. Therefore the questions asked needed to be carefully designed in order to gain maximum insights in sustainability practice in German SMEs.

6.1 Future sustainable society –Research Case Scenario

As discussed in the literature review a future scenario of a sustainable society is used to gain addition data of future views.

A model of a sustainable society is described by several authors (Albert and Brunner et al. (2001), Shove (2010), Peach (2012)). This research will mainly take the idea of Peach (2012) to create the scenario because there are some interesting projects in Europe, which try to live in a sustainable way based on Peach's idea. One of these projects is "Transition town Totnes" in the UK (Transition Town Totnes Ltd (2015)).

The suggested sustainable society focuses on local self-supply, ecological uncoupling of economic growth and much lower consumption which are the three main pillars of this society (Peach (2012), see 4.5 Sustainable society). This also includes changing the current monetary system based on interest earnings and avoiding high profit-earnings. Therefore a real sustainable society will, as far as possible, have a local industry which has mainly smaller companies for local needs, much less consumerism (change of marketing way), sustainable long-lasting products which are easily repairable, community workshops and gardens and much less products manufactured. In addition, the pace and use of innovations will be different, since products life will be significant longer.

Business in such an environment will be significant different for SMEs for example networking will get a new dimensions as well as offering service and of course shorten

profit. The interview will catch the views from SMEs how business in such a society will look like.

6.2 Interview Data Analysing Processes and Derivation of Questions

The interview questions where designed in order to find out which factors are influencing sustainable praxis in companies. In order to address all factors found and selected in the literature review; Trust, Political and institutional values, Social dilemma – personal rational decisions, Knowledge and education, Advertisement and Marketing; the interview was created with different section to address the different factors and different time frames (now and future). The questions were designed as open questions in order to find out thoughts and opinions. All questions have been checked and reviewed by four volunteers to minimise bias and to get out the best answer. The volunteers were people interested in sustainably and a higher education. Based on this pilot some questions needed to be clarified and some words with an attached association needed to be changed to avoid bias like using the word profit. Profit has a negative message attached in German language and therefore another word, in this case margin, needed to be used.

After questions about company (size, location) and position in the company the first question is a very open question (What do you think about sustainability and what does it mean to you?) to find out what the respondents actually know/think about sustainability. This starting question also defined how the interview will go on. During answering the questions some guidance/explaining will be offered to help the interviewee to answer this question as well as possible. It was taken care not to influence the interviewee's opinion by not judging or commenting answers of the interviewee. The open question offer only low constraints, which is needed to get the best possible answer (opinions, ideas, meaning).

Some questions, which come later during the interview, may have been answered already or new question will arise based on the respondent's statements. Therefore, the order of the questions as well as the questions themselves is thought as guidance rather to be followed exactly. All following question deal with one of the determined factors or with different timeframes (Figure 9): education, trust, social dilemma, political and institutional values (institutional theory), marketing, future outlooks and connections between the factors (see Table 15).

After finding appropriate companies, they were contacted via phone and asked if there were willing to give interviews. If they agreed an information email was send with details to

Coventry University, myself and the research topic. Personal identity of the researcher has influences of the interview results (Denscombe (2010)) and therefore it was decided to introduce myself as an experienced engineer and manager. In addition, the "participant information sheet" the "informed consent form" and the interview questions were send together with the email. The companies were asked to sign off the information sheets and send them back.

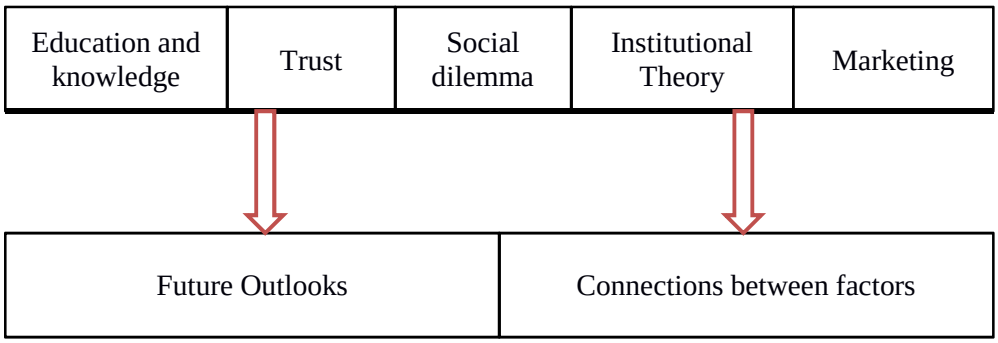

Figure 9: Research Scope – Factors, Connections and Future Outlooks

Interviews were mainly held by phone. All interviews were recorded and later analysed and written down in a table for further analyses and work.

The interviews always started with the introduction of the research topic and of the participant and the first question about general opinions about sustainability.

The recorded interviews where first analysed as a whole by listening to the recordings again. Categories for analysing the interviews were taken from the Circles of Sustainability approach. These categories where used to create a table which also contains columns for basic information (position etc.), for the general approach towards sustainability and columns for the influencing factors and their connections. This approach could be described as observation, since the way of speech or emphases of some statements are taken into account to decide which category an interviewee belongs to (Graziano and Raulin (2012)).

The next step will be to listen to the recorded interviews again and take information out and write it in the appropriate cell of the created table. This way of a first analysis is used to get a structure into the interview data which will ease the final data analyses.

In order to take information out in a structured way the sub-domains of the Circle of Sustainability are used. Data have been match with a category which represents the value or opinion best described in the text. In a second step, the content of the categories were

reviewed and matched to the five factors or other sustainability categories for example “social dilemma” or “economic emphasis” in order to point to a sustainability issue.

The number of statements were counted and categorized. The counting represents how many people have a certain opinion and categories are used to determine where certain factor is coming from.

The third step will be to look at data for each factor, derive information which support or weakens the influence of this factor. Finally there will be crosschecks between the factors and connections to find further connections or new factors as well as a weighting of the influence. The weighting of a connection or a factor has been determined by the frequency of a phrase mentioned and by the importance expressed in the interviews for a company. These connections or additional factors were also counted and categorized as needed. Categories are derived from the sustainability pillars or factors used.

The explained data sampling rate (see section “2.4”) has been extended due to a low response rate. After contacting all 150 SMEs, only thirteen SMEs were willing to take part on the interview. Therefore, further 100 companies were contacted by phone and asked if they like to take part to get the right number of interviews. Selecting the first listed SMEs randomly were dropped, since all listed companies needed to be contacted.

The response rate, industries, and analysis of companies which do not want to take part are described and presented in the next chapter. The data analysis of the interviews is done in section 6.2.2 (Interview Data Analysis).

6.2.1 Data Analysis Interview Framework

The 250 contacted companies belong to different industries. The industry of the SME was either taken from the internet portal or from the SME's internet page. The diversification of the industries is shown in Figure 10.

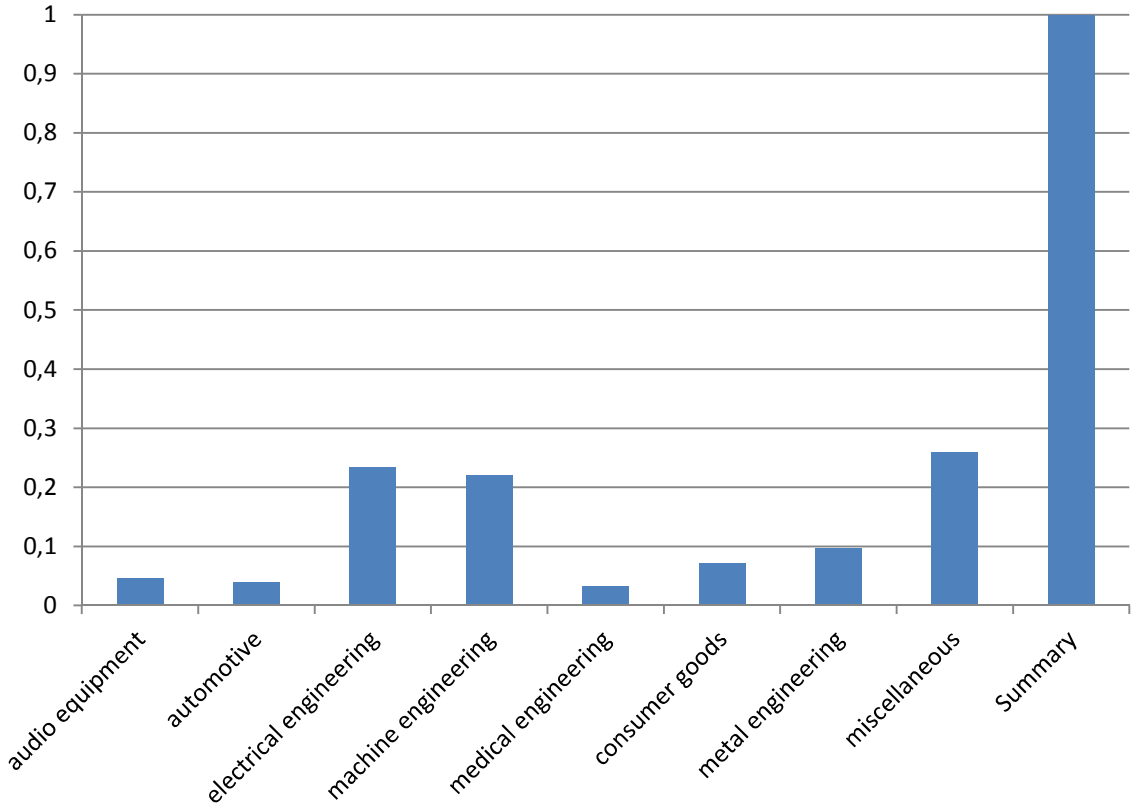

Figure 10: Industries of the selected SMEs

All selected SMEs belong to an industry which manufactures and/or design some products. In addition, electrical, metal and machine engineering companies are the majority of companies in Germany. In the miscellaneous industries are such industries like furniture manufacturers, plastic engineering or recycling companies. Eighteen SMEs have only Business-to-Business customers and only two companies sell to private customers.
The response rate was 9.2% or 23 companies. This rate is fairly low in comparison with the stated response rate in section 2.4 (Collecting Data) which was not expected in this way; the expected response rate is 18-24% (Goffin (1992), Steinbacher (2014)).

The companies which refused to take part have been investigated in order to find out the reasons for refusal as well as the general involvement in sustainability. The latter one is done by searching the company's internet page for information about sustainability

involvement. These data are used to determine the SMEs idea towards sustainability and is used as secondary data to support or weaken the interview outcomes.

The reasons for not taking part on the interview are shown in

Figure **11**. As one can see most companies did not response to the request even after sending a reminder. The motive for this behaviour can only be guessed but it seems it is a mixture of not having time and not having any interest in the topic. Second are the companies which have no interest in the topic of sustainability. Some of the companies in this refusal category ask which advantage they would have when taking park on the interview. Getting the latest information about sustainability was obviously not a driver to take part on an interview. They did not see any competitive advantage by implementing sustainable measures into their business.

The third category was not having time for any interview where the reason could be resource constraint. However, these companies were also asked if they are interested in taken part on a survey which will take considerably less time than an interview. Only five out of 227 companies (250 contacted companies minus 23 companies which took part on the interviews) were willing to fill out the survey but it seems that finally only one company did fill a survey out which is comparable to the general low response rate of the contacted SMEs. This could not be checked since the questionnaire was anonymous.

Finally there are the companies which do not do any interviews in general and those companies which think sustainability is not for them at all.

The underlying rationale of these refusal reasons cannot be answered in full since research necessary to find out these reasons is outside of the research scope. However, it seems that sustainability is not really seen as necessary, important and as a competitive advantage. In addition, there seems to be a lack of understanding of basic ideas of sustainability because many attendees see sustainability only as environmental protection.

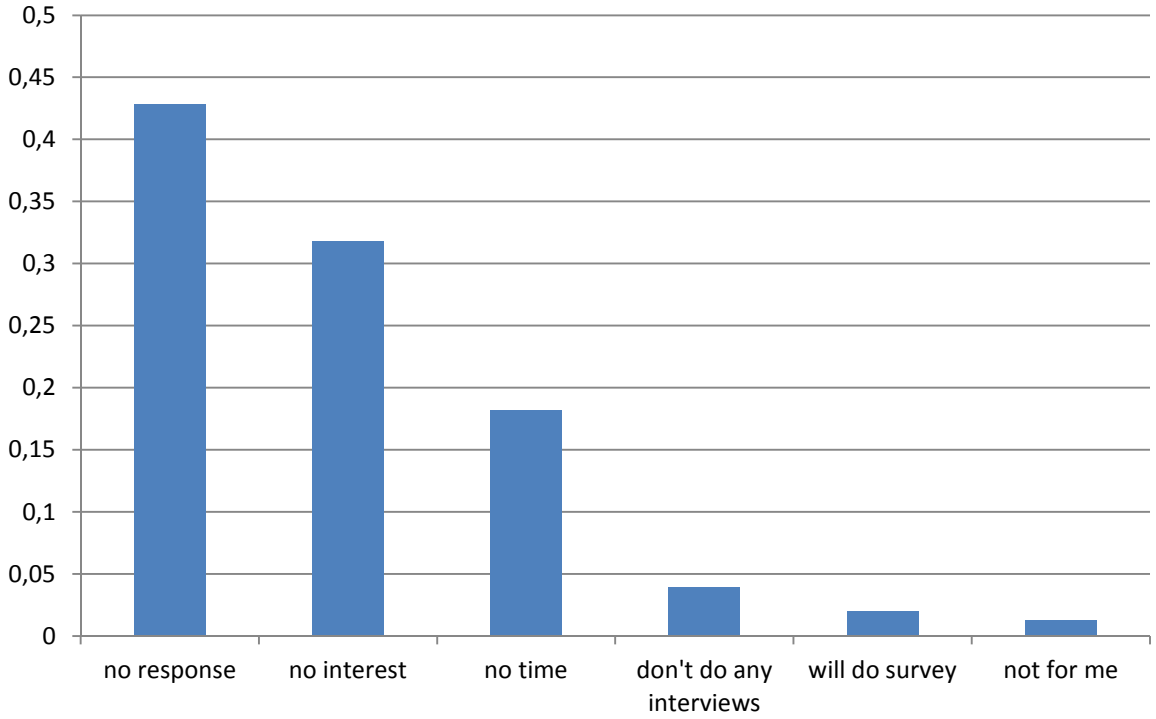

Figure 11: Reasons for not taking part on the interviews

The internet pages of the companies which did not take part on the interviews have been evaluated in order to get inside in the company's commitment to sustainability and environmental protection. The result of this research is shown in Figure 12. 60% of the companies which did not take part have no sustainability or environmental management system mentioned on their internet page. In the second category (14%) are those companies which have an environmental management system in place. Most of these companies are certified according to ISO 14001 which is an environmental management system and give more detail about the environmental measures on their internet page. In the third category (8%) are those companies who offer an environmental statement or policy. These statements are often fairly general and only scratch the surface of environmental management. The research cannot check if the company follows these statements or if these statements are just made because it is expected by customers.

There are several companies (3%) which emphasise on CSR and are involved in supporting local associations and sport groups. In addition, there are several companies which are member of an NGO which deals with sustainability or CSR.

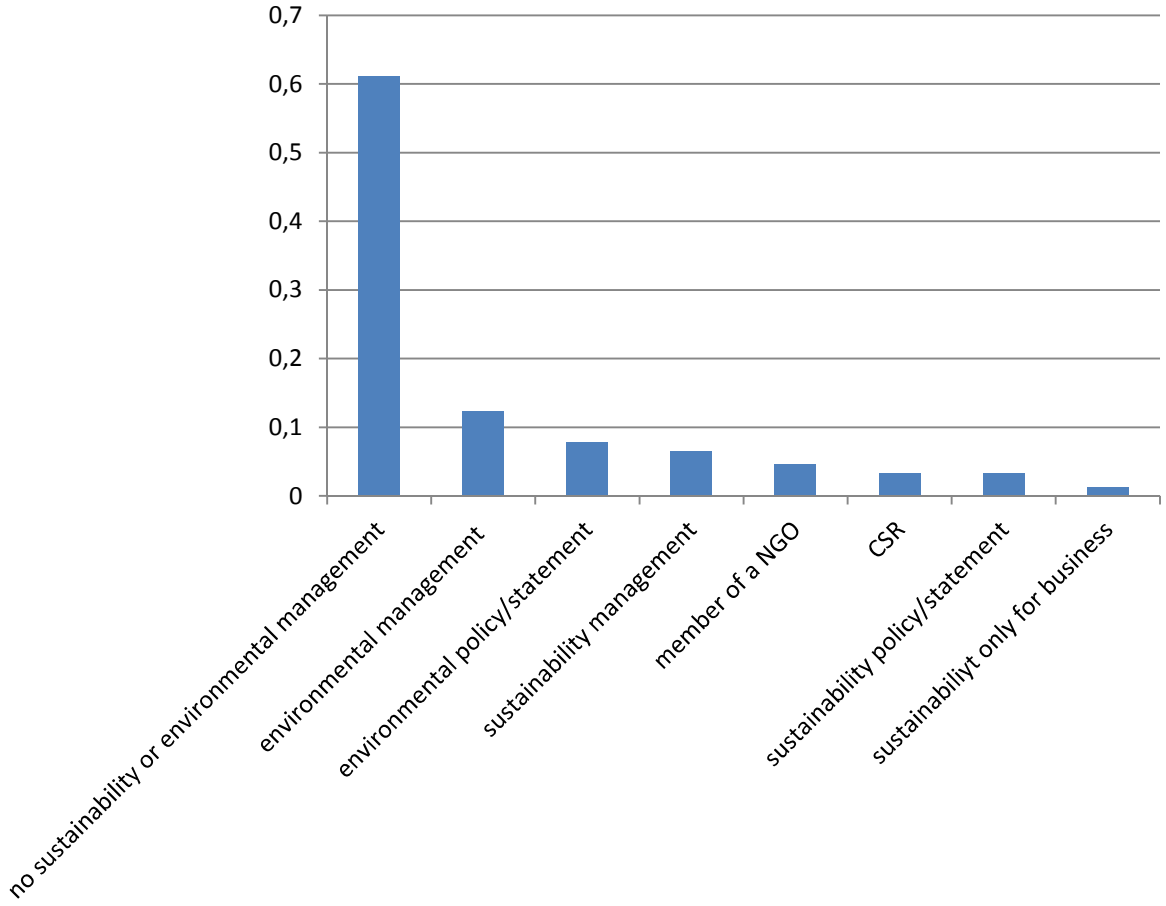

Figure 12: Engagement in Sustainability

The most often found NGO is “Ethics in Business” which also gives awards to companies which work according certain business ethics. However, these companies neither took part on the interview nor fill out the questionnaire. Some of the memberships are mainly used as marketing tool rather than being sustainable or follows certain business ethics. There are a few companies which tick all boxes: sustainable management, social responsibility and supporting some local and international NGOs. The statements of these companies are very detailed and it seemed they really implement sustainably into the company’s strategy. Unfortunately, only five companies out of 227 belong to this category.

Taken the above figures into account it can be said that sustainability in German SMEs appears not very important and often ignored or just seen as a necessary evil which is not surprising.

6.2.2 Interview Data Analysis

There are 31 interviews taken from 23 companies (eight companies gave two interviews). The structure interview data is in Appendix G – Interview Data.
The analyses of the data is organised according the factors determined in the literature review. In addition, there will be a section which discussed possible connection between the factors as well as a sub-chapter which looks into the future and discusses opinions about the model of a sustainable society (see section 6.1 (Future sustainable society –Research Case Scenario)). The first following section looks at the general attitude of the attendees towards sustainability.

6.2.2.1 General Attitude towards Sustainability

The first question in every interview was as follow:

What do you think about sustainability and what does it mean to you?

This question tried to find out the general attitude towards sustainability. Since the interviewees attend voluntary to the interviews about sustainability it was expected that some knowledge about sustainability was present.

All answers were analysed and the most important statements (opinions) been entered into Table **16**. These statements are directly derived from the interview data by analysing statements and looking for keywords and phrases.
Thirty interviewees (97%) think that sustainability is important in one or another way and are able to name a few issues with sustainability. In addition, all statements have been assigned to a category where the statement belongs too. The categories were taken from the Circles of Sustainability approach. Furthermore, it was determined if a certain factor is a barrier or a driver and market as: negative (barrier) or neutral. Drivers are not explicitly marked.
The most mentioned point is recycling of products (mentioned 17 times), which is not surprising because recycling is an important issue in Germany. Germany has implemented the so named “Dual System” which deals with collecting and recycling of household waste. In addition, there are regulations for companies which describe ways of recycling as well as organisations who support companies to recycle waste correctly.

Table 16: General statements towards sustainability

No	Domain (Circles of Sustainability)	Attitude and opinions towards sustainability	Number of statements
1	Ecology- Materials and energy; Culture - Identity and engagement, Enquiry and learning	recycles waste/old products	17
2	Ecology - Flora and fauna, Water and air, Emission and waste; Culture - Identity and engagement, Enquiry and learning	sustainability is environmental protection (focus on environment)	15
3	Economics - Production and resourcing	resource efficiency	12
4	Culture - Identity and engagement, Enquiry and learning; Politics - Ethics and accountability	sustainability is important	9
5	Economics - Consumption and use, Technology and infrastructure; Culture - Identity and engagement	high quality long life products (no planned obsolesce), no fashion products	8
6	Culture - Identity and engagement; Economics - Consumption and use	using public transport and/or bicycle	7
7	Economic - Production and resourcing; Culture - Belief and ideas; (negative)	sustainability important but not for small companies	5
8	Culture - Wellbeing and health; Politics - Law and justice, Ethics and accountability	fair payment for employees	4
9	Economic - Production and resourcing, Consumption and use; Culture - Identity and engagement, Belief and ideas	buying green products	4
10	Culture - Identity and engagement, Belief and ideas; Politics - Ethics and accountability, Organization and governance	sustainability is difficult to live due to fraud or product lies	3

No	Domain (Circles of Sustainability)	Attitude and opinions towards sustainability	Number of statements
11	Culture - Identity and engagement; Ecology - Emission and waste	buys product with less packaging (privately)	3
12	Economic - Production and resourcing, Exchange and transfer; Culture - Identity and engagement; Politics - Ethics and accountability	fair trading of resources and products taking sustainability into account	3
13	Culture - Identity and engagement, Belief and ideas; (negative)	sustainability will be important in the future	3
14	Culture - Enquiry and learning	sustainability has three pillars (environmental, social and economic)	2
15	Culture - Identity and engagement, Belief and ideas, Gender and generations; Politics - Ethics and accountability	world needs be kept liveable for future generations	2
16	Culture - Identity and engagement, Belief and ideas; Politics - Ethics and accountability	family is most important	2
17	Economic - Production and resourcing, Technology and infrastructure	products need to be recyclable	2
18	Culture - Identity and engagement, Belief and ideas;	low fuel consumption car in use	2
19	Culture - Identity and engagement, Belief and ideas;	sustainability is a lifestyle	1
20	Ecology - Flora and fauna, Emission and waste	products should not damage environment in the long run	1
21	Economic - Production and resourcing, Consumption and use; Politics - Ethics and accountability, Organization and governance; (negative)	compromise of sustainability for economic	1

No	Domain (Circles of Sustainability)	Attitude and opinions towards sustainability	Number of statements
22	Economic - Production and resourcing, Consumption and use; Politics - Ethics and accountability, Organization and governance; Culture - Identity and engagement, Belief and ideas; (negative)	disasters are used to make profit (seen as a business option)	1
23	Culture - Enquiry and learning; Politics - Dialogue and reconciliation	more research and simple explanations needed	1
24	Economic - Accounting and regulation, Production and resourcing	low running cost of a product	1
25	Ecology - Water and air, Emission and waste	climate protection	1
26	Culture - Identity and engagement, Belief and ideas; (negative)	sustainability is overrated	1
27	Economic - Labour and welfare; Politics - Law and justice; Culture - Wellbeing and health	good work conditions for everyone	1
28	Culture - Identity and engagement, Belief and ideas; Economic - Consumption and use	reducing of consumerism needed	1
29	Culture - Identity and engagement, Belief and ideas; Politics - Ethics and accountability	grows own vegetables and fruits	1
30	Culture - Identity and engagement, Belief and ideas; (negative)	sustainability is traded like fashion for many	1
31	Culture - Identity and engagement, Belief and ideas	sustainability is only for private life	1
32	Culture - Identity and engagement, Belief and ideas; Economic - Consumption and use, Production and resourcing	buying local products	1

Two attendees mentioned that products need to be easy recyclable due to design and a few companies have already implemented such an approach into their product design. However, most of the designs are still costs driven rather than driven by sustainability.

The second frequently mentioned point is that for many attendees sustainability equals environmental protection which seems to be related due to many environmental campaigns in the world. Only two attendees (see point 14) emphasise that sustainability contains three pillars. However, many attendees have a wider view towards sustainability as can be seen in points 3, 5, 8, and 12. None of the attendees took culture into account as a worthwhile sustainability issue. This research sees culture as one of the four pillars of sustainability. However, many statement made are driven by cultural influences as stated in the category columns.

Point 3, resource efficiency, is the third most mentioned statement of the interviews. Resource efficiency is particular important for German companies since Germany has hardly any resources and most of the resources need to be imported. This statement also expresses the knowledge that resources are not endless and need to be used economically and wisely. This fact is also expressed in point 5, 9 and 12 which focuses on fair trade and good product quality which leads to a long product live. Buying and producing such products is mentioned by eight attendees which stresses also its importance. These points belong to different categories which also show the connections between the four domains within the Circle of Sustainability.

Though, it could not be ruled out that some statements are not given because the attendees are not aware it is a part of sustainability.

The next points focus on mobility and transportation. Point number six, using public transport and/or bicycle, focuses on one of the major problems in modern society – mobility. There are only eight attendees, together with point 18 (using a low fuel consumption car) which sees transportation important and put some measures in place.

Point number 7 emphasises that sustainability is an important issues but less for small companies. Five attendees advocate this opinion which shows also a problem with smaller companies taking sustainability into their strategic planning.

Point number 10 (sustainability is difficult to live due to fraud or product lies) points towards the term “green wash” which means products are marketed as being green but they are not.

Finally point number thirty-two which mentioned “buying local products”, only one attendee sees this as a sustainable action. This outcome is contrary to the important role of local products since they are seen as a major contribution to sustainability (Shove (2010), Peach (2012)), and also advertised by local governments in Germany (local food).

The statements show that sustainability is important and people are aware of it. The thirty-two different statements also show the diversity of sustainability but also the lack of knowledge and education. Sustainability is often not understood in full or limited to environmental protection. In addition, many statements are taken from news or government campaigns without having the necessary background information.

There are very few people who still think sustainability is not important and nothing needs to be done. In addition, the categories show that most statements come from a cultural view as shown in

Figure **13**. One can argue that the influence of the society and its values are greater than business influences. However, many statements refer more to private life rather than business life for example “I recycle packaging of products I buy in the supermarket” or “I use often my bicycle and leave my care at home”.

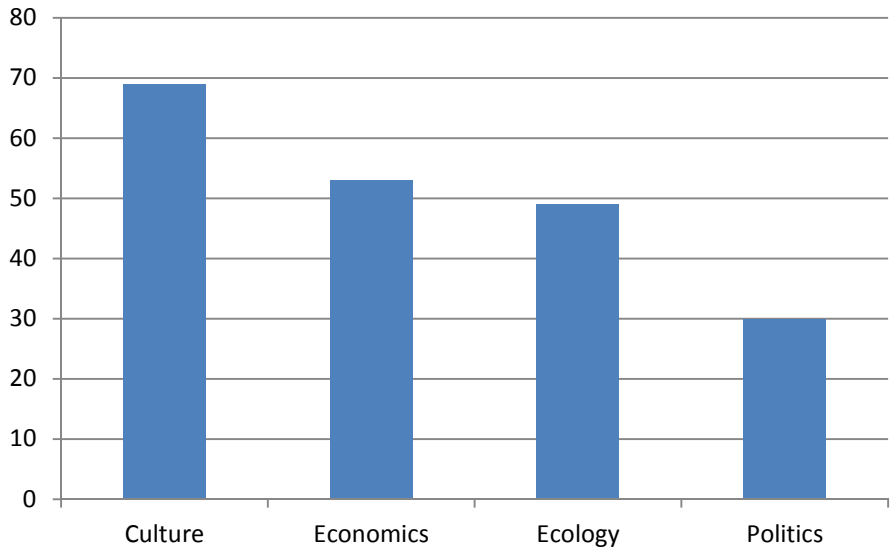

Figure 13: Number of Statements per Category (Circles of Sustainability)

The focus on private life in an interview within a company seems to show, that sustainability campaigns reach private people rather than companies.

Looking at the four domains of the Circle of Sustainability, 69 statements have been made which refer to culture. This domain seems to have the highest influence towards sustainability.

The following factors will also discover if the above shown knowledge is used to take actions or not.

6.2.2.2 Education

This factor category belongs to the Culture domain of the Circles of Sustainability approach and is trying to find out which education the interviewees have and how to the gain knowledge about sustainability. Therefore, the first question of this factor within this category was what the highest education of the attendee is. All managers have a higher education mostly a degree of engineering or business administration. Only one attendee has only A-levels all other attendees which are not manager had an apprenticeship or other higher education.

The different statements towards education in the field of sustainability are listed in Table 17.

Table 17: Statements about sustainability education

No	statements about sustainability education	Number of statement
1	attendee has no formal education in sustainability	28
2	sustainability education is not promoted	15
3	other employees have no formal education about sustainability	13
4	gets knowledge from internet and other media	8
5	taken part on seminars about sustainability	4
6	some colleagues have sustainable education	4
7	gains knowledge from journals and magazines	3
8	sustainability was part of study	3
9	attendee has a formal education in sustainability	2
10	knowledge often overruled by customer	1
11	sustainability education is supported	1
12	sustainability education not important	1

Twenty-eight attendees have no formal education about sustainability at all. They get the information from journals, internet, and news as well as from seminars. In addition, sustainability education is not promoted in most of the attending companies and also other employees in a company, as much as the attendee is aware of, have hardly any education about sustainability.

The reason for the lack of education in sustainability could not be determined but the lack of sustainability education offered could be one reason. However, the offer of courses in sustainability is raising and flyers have been sent to companies (for example TUV Akademie). This may raise awareness by managers that courses are offered and education in sustainability could develop the company further.

An interesting statement has been done by one attendee: “knowledge often overruled by customer” which shows that knowledge alone is not enough. The influences from customers are generally high and industrial customers are often very pricing sensitive.

It was apparent that those attendees with higher education or those which gain information from journals and seminars could answer the interview questions in more detail than those with lower education or those which do not do anything to gain knowledge about sustainability. This information was asked during the interview: highest education and, as seen in Table 17, “how do you inform yourself about sustainability topics”. However, most attendees have knowledge but limited about sustainability what is reflected in the answers given. On the other hand, those attendees who studied recently gained some knowledge about sustainability in the university which shows knowledge about sustainability is getting more important and some universities react to this. If knowledge could also lead to actions towards sustainability will be discussed in section 6.2.2.9.

Education in sustainability is needed in order to act in structured way and to implement sustainability strategies into a company. It is also an important resource for SMEs if employees have good knowledge in sustainability which can lead to competitive advantages (Spangenberg (2005), Markulev and Long (2013)). Most German SMEs do not yet see good knowledge in sustainability as a valuable resource.

6.2.2.3 Trust

Trust is anchored in the Culture and Politics domain of the Circle of Sustainability approach and is therefore an important driver or barrier for sustainability. The statements towards trust are shown in Table 18.

The table shows that most companies do appreciate ideas from their employees which is a good foundation for realising innovations and therefore sustainability (Princen (2005), Kury (2012)). However, as point 2 shows, there are hardly any ideas about sustainable measures from employees. One can argue that some ideas are sustainable but not recognised as sustainable ideas. This could not be checked because it is outside of this research's scope. Furthermore, staff are usually involved or informed about cooperate decisions which is a way forward because smaller German companies usually do not involve staff in management decisions (Buerke (2012)).

Table 18: Statements about trust within the company

No	Statement made by	statements about trust in companies	Number of statement
1	Manager	employees ideas are appreciated	22
2	Manager	hardly any ideas about sustainability	13
3	Manager	staff are involved in cooperate decisions (if affected)	10
4	Manager	staff are informed about cooperate decisions	8
5	Managers, staff	ideas with short term success preferred	6
6	Managers, staff	staff are not involved in cooperate decisions	5
7	Staff	most ideas are not implemented	4
8	Staff	ideas with no direct ROI not appreciated	3
9	Manager	ideas about sustainability are taken into account	2
10	Staff	sustainable behaviour not encouraged	2
11	Staff	ideas of employees are not appreciated	2
12	Staff	sustainability ideas taken into account but often not proceeded	1

It is evident that there exists a tendency to focus on ideas which have a short term success; implementing long term ideas seems for many German SMEs still a problem which was mentioned by six interviewees. The reason for this is manifold but one factor could be raising competition from cheap producing companies. This is a particular problem for many German SMEs because of their focus on export markets.

Another problem with trust in companies is encourage ideas form employees but not implementing them at all as shown at point 7 and 12. This can lead in the long run to a loss of trust because employees feel annoyed and not taken seriously (Buerke (2012)). Supporting employee's ideas is in this case only an alibi function.
This factor could confirm most of the points found by Bliesner and Dreuw et al. (2011) which is the discrepancy between staff and managers' view towards employee involvement. However, there is also a way forward by involving employees into decision. Furthermore, there is still a lack of ideas towards sustainability where reason can be found at the other factors researched. Moreover, trust is also connected to the government and other NGOs. Trust within a group and to authorities can influence behaviour to sustainability (Naderi and Strutton (2015), Ernst (2014)). This shows a connection between trust and social dilemma.

6.2.2.4 Social dilemma

The social dilemma is a very important factor which belongs to the Culture and Politics domain which influences sustainability because it focuses on human behaviour. The results of the interviews are shown in Table 19. The statements have been derived for the interview data. There were four explicit questions which targeted the Social Dilemma factor.
The most mentioned point was that "profit is more important than sustainability" which is not surprising because profit is needed to run a company. However, a trend exists that more investments are made in sustainability or sustainability measures are implemented as shown in point 4. However, one the problems many German SMEs faces is fierce competition from cheap products mainly made in China (see point 5 but also 6). Some interviewees gave the impression that the daily business is cutting cost as much as possible to have a chance to sell their products. There is no time and resources to think about sustainability.
The interviewees were also asked about company cars and business trips. Not surprisingly most company cars are selected by personal preferences given some limits set by the company. Many manager drive luxury cars like BMW, Audi or Mercedes and low fuel consumption or pollution is not taken in consideration. Only one company supports cars with low fuel consumption (green cars) but electrical driven cars are not mentioned at all.
There are a few interesting statements made about customer behaviour and influence. Point 9 stated that selling fashion products seems to be an easy way to make profit. There is maybe a higher risk involved by producing fashion products but if customers are interested

they can be sold easily. In addition, point 10 stated that customers are more interested in cheaper products than in high quality products. Customers can drive innovation and sustainability but also can prevent innovation (Gualandris and Kalchschmidt (2014)). This is one of the external factors which can prevent implementing sustainability into companies.

Table 19: Statement about social dilemma

No	statements the social dilemma and personal rational choice	Number of statement
1	profit is more important than sustainability	31
2	company cars selected according personal preferences	14
3	travel time and cost important when booking business trips	13
4	first investments made into sustainable long term projects and measures	10
5	external pressure by cheap competition is high	5
6	survival attitude	2
7	small companies cannot survive if sustainability strategies are implemented	2
8	stable economy needed to acts sustainable	1
9	selling fashion products - easy way of earning money	1
10	customers prefer cheaper option rather than high quality option	1
11	low fuel consumption cars are supported	1
12	most company decision are made on cost	1
13	if sustainability than more like flavour of the month	1
14	customers are not interested in sustainability	1
15	source resources from countries which have reasonable work condition and environmental protection	1
16	business cars selected by low investment and low running cost	1

Finally point 8 stated that a stable economy is needed in order to act sustainable. Unfortunately a stable economy is only possible when companies act sustainable. This is a typical social dilemma problem since no one wants to disadvantage by doing the first steps (van Dam and Apeldoorn (1996), Naderi and Strutton (2015)).

The social dilemma is very important as well as a difficult factor which influences sustainable behaviour. According to the interviewees this factors has a powerful influence towards actions within the company.

The personal rational choice (social dilemma) is a major barrier to sustainability. However, there are solutions offered, like government campaigns, sustainable marketing, behaviour policies, but these measures are difficult to implement into the praxis and forecasting human behaviour is not reliable (van Dam and Apeldoorn (1996), Naderi and Strutton (2015), Chen and Perc (2014), Mengel (2014), Zelenski and Dopko et al. (2015)). On the other hand, the social dilemma factor is a strong factor in the sustainable game and focus of research need to be on this problem.

Conversely, Stein (2012) sees even dilemmas within environmental or sustainability groups and gave several examples. One is that many groups support renewable energy like sun power, but if larger sun power station should be build they fight against such project in order to protect nature. Real solutions are not offered.

6.2.2.5 Institutional Theory

The institutional theory is part of the Politics domain but has strong connections to Culture and looks at ways of life in a society as well as influences from government bodies which includes laws and regulations. This factor can influence sustainability in a positive or negative way depending on external influencing factors, the general culture of society as well as regulations and government decisions and campaigns. The statements done towards political and institutional values are shown in Table 20.

The most mentioned statement is that new laws and regulations towards sustainability are implemented. Implemented regulations get sooner or later absorbed into the way of working and will be good working practices. Similarly such working practice can also be absorbed into the society. The “dual system” is such a working practice which deals with waste recycling and bringing back of packaging to the market where it was purchased (deposits).

Table 20: Statements about the institutional theory

No	statements about institutional theory	Number of statement
1	laws and regulations about sustainability are followed	26
2	sustainability problems in export market are taken into account	7
3	sustainability measures which go behind regulation are implemented	7
4	not more done than needed	6
5	there is a trend towards organic products	6
6	sustainability in Germany is an important driver	6
7	sustainability in Germany is getting more important	6
8	sustainability in Germany is somewhat important	6
9	there is a trend towards greener products	4
10	trends in Germany are influenced by marketing and fashion industry rather than the government	3
11	slower pace in technical innovations needed	2
12	lobbyism avoid democratic and sustainability	2
13	some important industries seems to be outside of sustainability regulations	2
14	fraudulent go green campaigns from government	2
15	sustainability problems in export market are not taken into account	2
16	Governments ideas about sustainability are inconsistent	2
17	obsolescence by technical innovation should be checked by the government for sustainability problems,	1
18	sustainability in Germany is fashion	1
19	many people have not much ideas about sustainability	1
20	sustainability in Germany focuses on households rather than companies	1
21	many people leave sustainable action to others	1
22	business has more influences than government	1
23	trend towards greener lifestyles	1
24	there is no real sustainability in Germany	1

Sustainability issues in export markets are taken into account by many companies whereas the main drivers here are customers or legislative demands. Europe is mentioned several times as the only export market which makes implementing regulations and sustainability demands easier due to harmonisation.

There are six companies (see point 3) which go further when implementing regulations and put new sustainability measures in place. Mentioned measures were sustainability management certification or buying resources taken environmental and social impact into

account. These can be a model for other companies as well as customers to follow the same way.

Speaking about sustainability in Germany there are some mixed messages: points 6, 7 and 8 says sustainability is in one or another way important in Germany whereas points 14, 18, 21, 24 say that this is not the case. Here, the point of view of the attendee has to be taken into account if the focus is more on public life or business life. However there are some trends towards buying greener products or organic products (food) in Germany but they often apply just to a small range of products or special industries. Nevertheless, this could be a driver which can influence other consumers and industries.

There are also some statements about inconsistency and influenced decisions towards sustainability of the government. Some attendees mentioned influences from external markets as well as lobbyism which also threaten democracy in general. This is consistent with findings of Georgantzas and Contogeorgis (2011), who see influences from industry and lobby groups as a threat for democracy.

Finally point 17 (obsolescence by technical innovation) is fairly interesting because it sees responsibility of the government as well as society by avoiding obsolescence by technical innovation. According to this attendee, there should be regulations which deal with obsolescence caused by technical innovations because these can heavily influence unsustainability. Unfortunately, this behaviour is sometimes supported by the government. Examples for this are support buying cars with lower pollution, support for buying fridges with lower energy consumption and examples for obsolesce by technical innovations are Beta Video, CD; DVD; Fire wire and many more.

Institutional theory is an important factor for sustainability but is also influenced by many factors. Our time is short-lived which relates to fairly quick changes in the behaviour of the society. According to Spangenberg (2005) and Spence and Ben et al. (2011) institutional theory influences social values and can be a driver for society. In addition, internal structures and cultures in companies are also prejudiced by institutional theory. Having said that, the institutional theory has major influences into sustainability not only with regulation and laws but also by social values and way of life.

6.2.2.6 Marketing

Marketing is an important sales tool as well as a significant determinate of strategy for all companies (Jobber (2010)). Therefore marketing belongs to the Economic domain but also to the Culture and Politic domain because marketing reflects and influences values and can be used by governments to spread messages and influence values.

Marketing is the interface between company and customer, promotes products and services and determines customer needs and therefore determines companies' strategies for offering products and services. As already seen in section 3.1 (Sustainability challenges in different contexts) marketing is a major driver for consumerism and has therefore high influences towards unsustainable lifestyles. On the other hand government campaign tries to influence consumers to be more sustainable using marketing tools. The interview results are shown in Table 21.

Table 21: Statements about marketing

No	statements about marketing	Number of statement
1	marketing does not support sustainability	17
2	hardly any or very small influence of external marketing into company	13
3	marketing could be used to promote sustainability	9
4	external marketing influences company	7
5	no influence of external marketing into company	5
6	some influences from external marketing	3
7	marketing needs to be regulated in order to promote sustainability	3
8	advertisement is not very honest	3
9	companies use sustainability marketing to look good - no implementation	2
10	marketing influences are more unconscious	2
11	marketing could be used to target customers which are interested in sustainability	2
12	marketing is disregarded by people who think in a sustainable way	2
13	marketing for customers who value sustainability possible	1
14	sustainability marketing will be difficult to implement	1
15	government campaigns have influenced the company	1

Apparent is that most attendees think that marketing is not able to support sustainability. Marketing is seen as a sales tool rather than spreading the message of sustainability. This reduction of marketing to a sales tool is obviously not correct since marketing has many more functions. The reason why many people see marketing like this was not researched further but the strong focus on sales in Germany and other Western countries could be one reason.

Some interviewees think marketing could be used to promote sustainability but this is only possible if heavily regulated. The second point says that marketing from other companies hardly influenced the company which is hard to believe. However, statement 10 points towards the possible problem - marketing influences are more unconscious. The message is there but people do not think about it.
On the other hand there are still 9 respondents (31%) which think marketing could be used to promote sustainability. Most of them also stated that marketing need to be regulated. With other words, the message is marketing as practiced today is not suitable for promoting sustainability but could be if necessary changes are made.
Another point is that people are influenced in the way a company wants by using sustainability slogans or promote a product as green but it isn't (points 8 and 9).
One can say marketing is used to influence people to buy a service or product but sustainability is not the real message of most companies. However, also governments use marketing to promote ideas and one statement says it influences the company (point 15) which is quite a low figure. There were also a number of attendees which did not know much about marketing and could not make any statement.

6.2.2.7 Future outlooks

The questions to the future outlooks point towards changes needed as well as how changes could be achieved. It links current planning approaches with the future and looks into missions and visons of a company.
A model of a sustainable society (see chapter 6.1) was shown and the attendees should make their statements about it. The answers of the question about future outlooks are shown in Table 22. The table also stated the domains of the Circle of Sustainability for each statement.

Table 22: Statements about the future of sustainability

No	Domain (Circles of Sustainability)	statements about the future	Number of statement
1	Economics - Production and resourcing	business strategy need to change towards sustainability	24
2	Culture - Identity and engagement; Politics - Organization and governance	sustainable society not possible	16
3	Economics - Production and resourcing, Consumption and use; Culture - Identity and engagement	products should be locally produced and sold as far as possible	18
4	Economics - Production and resourcing, Technology and infrastructure	design product for reuse or easy recycling	9
5	Economics - Production and resourcing, Technology and infrastructure	robust long life products	8
6	Culture - Identity and engagement, Belief and ideas; Politics - Organization and governance	sustainable society could be possible but very difficult to achieve	5
7	Culture - Identity and engagement, Belief and ideas, Enquiry and learning Politics - Ethics and accountability	behaviour of all people need to change towards sustainability	5
8	Culture - Identity and engagement, Belief and ideas	customer demand is an important driver for change	3
9	Politics - Law and justice	see laws and rules as driver for strategy change	3
10	Economics - Exchange and transfer, Production and resourcing	less global exchange of products in the future	2
11	Economics - Production and resourcing, Culture - Identity and engagement, Belief and ideas	no fashion products (moral obsolesce)	2
12	Economics - Production and resourcing, Ecology - Materials and energy	sustainable resources to be used	2
13	Culture - Enquiry and learning	difficult to understand model of sustainable society	2

No	Domain (Circles of Sustainability)	statements about the future	Number of statement
14	Culture - Identity and engagement, Belief and ideas, Politics - Law and justice	behaviour change only possible with regulations and education	2
15	Culture - Identity and engagement, Belief and ideas, Memory and projection	sustainable society not possible due to greed and egoism	1
16	Economics - Technology and infrastructure, Production and resourcing	transport need to change and more expensive	1
17	Economics - Exchange and transfer	trading of ideas globally rather than goods	1
18	Economics - Technology and infrastructure, Production and resourcing	strategic focus on local transport and production	1
19	Economics - Production and resourcing, Consumption and use	products need to be greener	1
20	Culture - Identity and engagement, Belief and ideas	no mass consumption	1
21	Economics - Production and resourcing	source resources locally	1
22	Same as No 1	strategy change need to be worldwide	1
24	Politics - Dialogue and reconciliation	strategy change should be rewarded by government	1
25	Culture - Enquiry and learning	more sustainability education needed in the future	1

Most of the attendees think that there is a strategy change necessary as point 1 shows. Some have already an idea how to do this whilst others know change is needed but could not specify what the change should look like. Most attendees focused on products – long life, easy to recycle, reuse as shown in point 4, 5, 11 and 19. Also the problem of fashion products and moral obsolescence has been mentioned. Many attendees also see production and selling of local products as an important driver for sustainability (point 3).

Other drivers for a strategy and behaviour change are seen in more regulation and laws (point 9 and 14) and customer demands (point 8).

Going local as an important part of sustainability is only mentioned by few attendees as seen in point 10, 17, 18 and 21. Here transport is seen as a problem especially for global exchange of products. Trading of ideas and not of products is named as a solution for more sustainability.

The evaluation of the sustainable society model has a clear vote: not possible. Only few attendees see this society as possible but also see a lot of difficulties. One attendee gave also reason why such a sustainable society won't be possible: greed and egoism of the people. As seen in the Literature Review these human characteristics are seen as a driver for unsustainability. In addition, it could be argued that German SMEs do not focus on long term planning and takes future sustainability challenges into account. However, there are some ideas of what needs to change in the future and Figure 14 shows in which domains the focus of future changes lies based on the categories of the interview results.

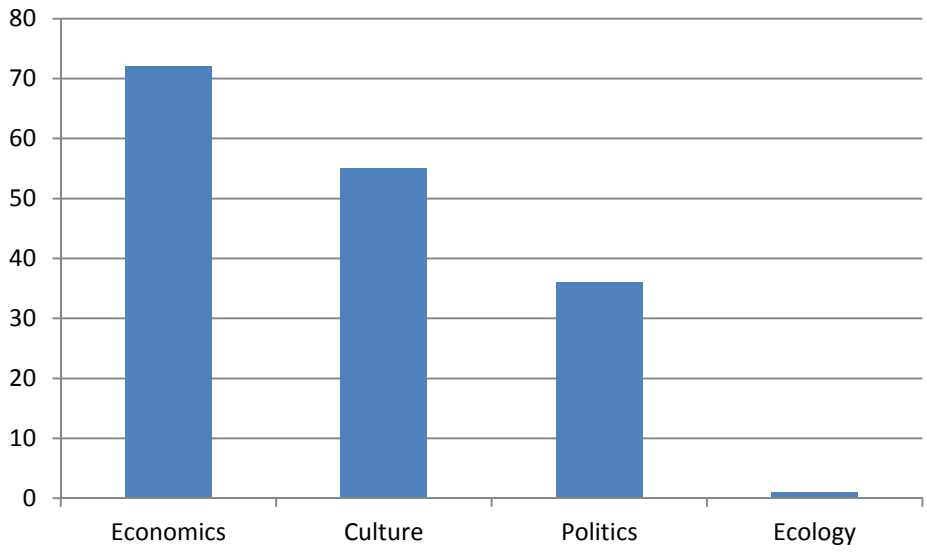

Figure 14: Domains where future changes are suggested

With 72 statement, economics is leading when discussing future changes followed by Culture (55 statements) and Politics (36 statements). Change in ecology seems to be not important which could be explained, that the other three domains influence the Ecology domain significantly. This means changes towards sustainability in the other three domains will also support and change Ecology domain. On the other hand, economics has the largest impact on sustainability and requires most changes to be sustainable. The current society focuses heavily on economic and economic growth and the resulting consumerism which explains the high impact of economics. In addition, this focus and behaviour is supported by politics as well as culture changes caused by marketing and value change. Therefore, the Politics and Culture domain follows the Economic domains and is seen as also important to change in future.

6.2.2.8 Sustainability tools

It was asked which tools for implementing sustainable strategies in companies are known or used or could be useful in the future. These tools are used to change company strategies and, therefore, are parts of the Economic domain.

Two tools has been named, which should be evaluated and discussed. A very common tool for sustainability as well as product and service evaluation is the Life Cycle Assessment and on the other hand a tool only for sustainable products is Cradle-to-Cradle.

The results of this discussion can be seen in Figure 15. As expected more attendees use and know LCA but many do not know Cradle-to-Cradle. In fact, there are no company which used or implemented the Cradle-to-Cradle idea so far. It seems this idea is not really attractive or understood or promoted properly in order to get recognised. This could be also connected to the critiques seen in chapter 3 (Critical Review of Literature about Sustainability and SMEs) where the cradle-to-cradle idea was rated as not taking all problems and side effects into account.

On the other hand, LCA is commonly known and also used but not very often for sustainability reason. It was said that a full LCA taken sustainability into account is difficult and time consuming and therefore expensive which means high costs and lack of knowledge prevent companies using LCA for sustainability issues.

There are a lot more tools already in existence to help to be more sustainable as already mentioned in the Literature Review but no attendee could name any additional tool which

will help to design a sustainable product and create sustainable processes. Again here is formal sustainability education needed if sustainability should be the new strategy of all companies in the future.

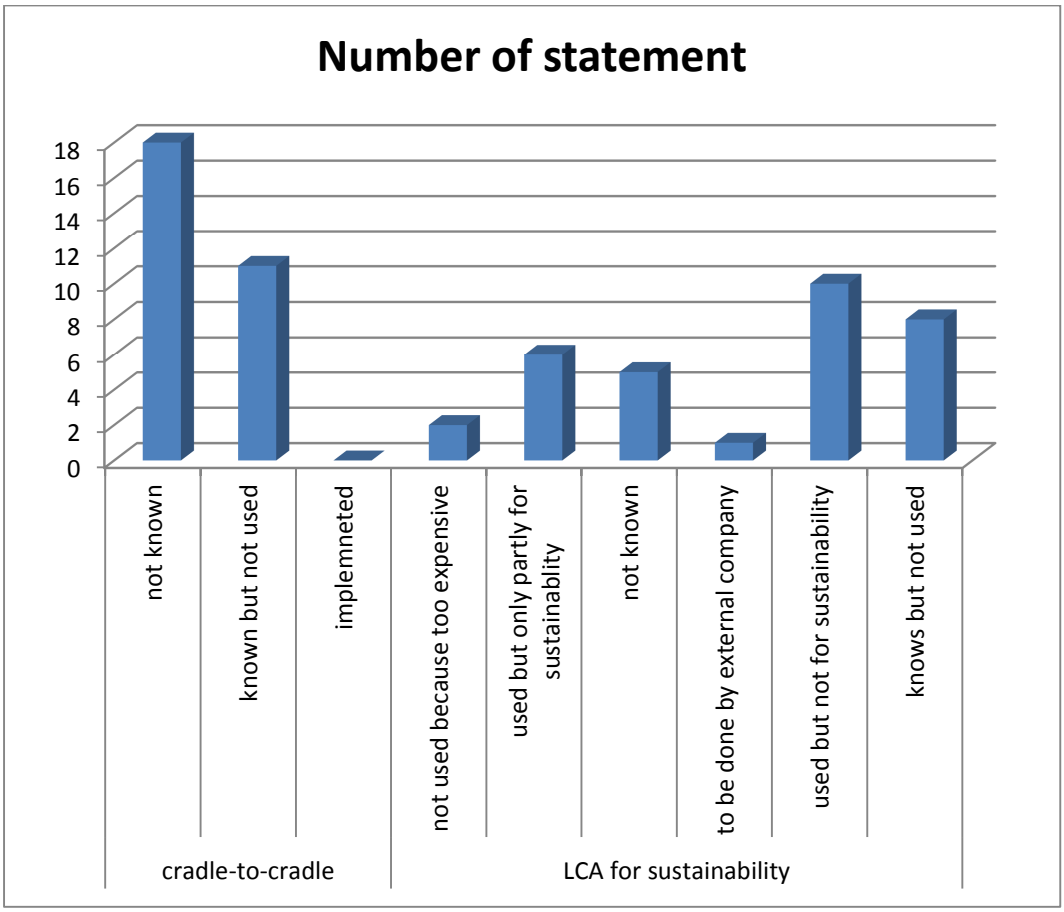

Figure 15: Use and knowledge of sustainability tools

As seen above, tools for achieving sustainability are hardly used or adapted which shows also a lack of long term planning as already pointed out in the section above. On the other hand, the two tools mentioned above requires time and resources which many SMEs do not have. However, other tools which could be useful for SMEs have not been mentioned by any participants.

6.2.2.9 Connections between the factors

There are some explicit questions within the interviews to get first ideas which connections could be between the different factors (column “Number of direct Statements”). The answers of these questions are shown in Table 23. However most of the connections are

taken form the interviews directly. The sum of all answers, direct statement and interpretations from the interview data are in the columns “Number of Statements”.

Table 23: Statements about connections between factors

No	Domain (Circles of Sustainability)	statements to connections between factors	Number of direct Statements	Number of statement
1	Culture; Economics	possibility to take part on decision processes in companies is important	10	13
2	Culture; Economics	knowledge is foundation of sustainability and lead to strategy change in companies and behaviour change	11	11
3	Culture	personal perception is main driver for sustainability	7	10
4	Culture; Economics	Buying and producing local products is a way to be more sustainable, less imports of products	8	10
5	Culture	education and personal perception are important for achieving sustainability	6	8
6	Culture	education about sustainability is important	7	8
7	Culture; Economics	knowledge about sustainability will change marketing	4	5
8	Culture; Economics	education, personal perception and possibility to take part on decision processes in companies is important driver	3	3
9	Culture	education in sustainability is important but personal perception could undermine sustainability behaviour	2	3
10	Culture; Economics	marketing could be important tool to promote sustainability and change social behaviour but prone to misuse	3	3
11	Culture; Politics	well explained laws and regulation are important for sustainability worldwide	2	3
12	Culture; Economics	Doubts that knowledge about sustainability will change marketing strategies	2	3
13	Culture	education is needed to act in a structured way	1	2
14	Culture	knowledge alone will not cause sustainable actions	0	2

No	Domain (Circles of Sustainability)	statements to connections between factors	Number of direct Statements	Number of statement
15	Culture	sustainability should be foundation of every education	0	2
16	Culture	involving staff in company's decision is not needed and will not support sustainability	1	2
17	Culture; Economics	knowledge about sustainability won't change marketing	2	2
18	Culture; Economics	Sustainability education and staff involvement is not important for SMEs	1	2
19	Culture; Economics	sustainable lifestyle to be promote in all media	1	1
20	Culture; Politics	governments are not trustworthy therefore campaigns often fails because of bad reputation	1	1
21	Culture; Politics	society/other people can influence positively or negatively	1	1
22	Culture	specialist for sustainability better than knowledge for everyone	1	1
23	Economics	Global networks are basis of sustainability if information is exchanged	1	1

The interviews were analysed and statements which reach over a certain factor and point towards another factor will be taken into account.

The connections have been categorised according to the domains of the Circle of Sustainability. It shows connection of the domain to sustainability as well as connections between the domains if more than one domain is covered by a statement. In addition, it is shown how many statements are made when a question about connections is asked and which statements are derived from the interview data from other questions.

The connections which are mentioned most often is knowledge about sustainability (points 2, 5, 6, 7, 8, 9, and 13), personal perception (points 3, 5, 8, and 9) and involving staff into companies decision (points 1, 8, 16, and 18) followed by buying and selling local products (point 4). This means that the most important connections are between education/knowledge, personal perception and staff involvement which points towards a strong connection between culture and economics which could be already determined in section 6.2.2.1. This is also reflecting by “Buying and producing local products” which names the culture domain (customer’s perception and values) but also the Economic domain (producing local products).

There also a few comments pointing to connections with marketing and education which says education do not support sustainable marketing. This goes along with the opinion that education alone does not lead to sustainable actions. A similar idea will be shown in point 10 which says marketing is prone to misuse. A strong personal perception towards sustainability could be a barrier for misuse.

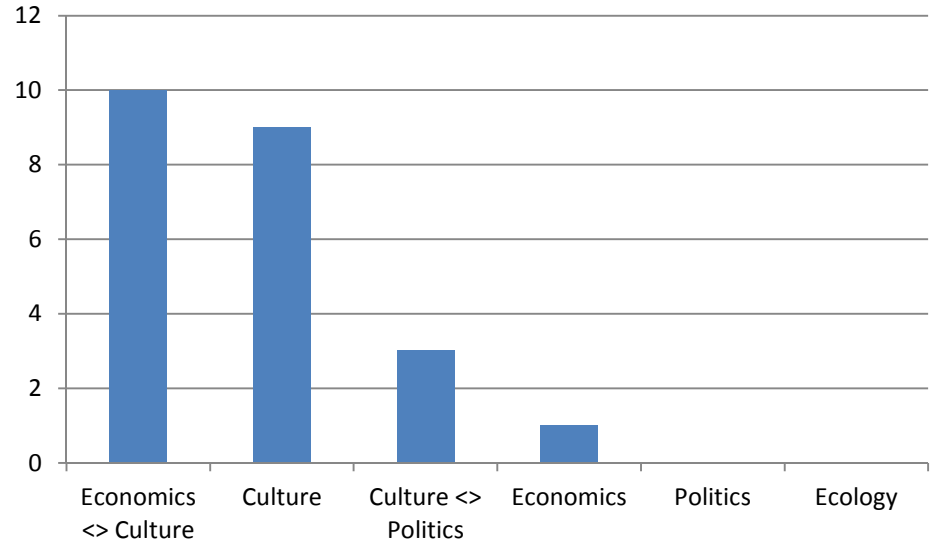

Figure 16: Connections between domains and sustainability per statement

Figure 16 shows the connection between domains as well as domains to sustainability derived from Table 23. The connection between Culture and Economics is mentioned in 10 statements and is therefore the most mentioned connection followed by Culture connected to Sustainability (9 statements) and Culture connected to Politics (3 statements). As with the other factors analysed in the sections above, Culture and Economics domains have the strongest influence to sustainability and are in the focus of most participants. Even if environmental protection is for many the focus of sustainability, influences or connections to Ecology are hardly seen. The reason for this could be that the Ecology domain is influenced and changed by humans but control and force comes from the other three domains.

The connections found in the interview data and represented in Table 23 have been analysed by checking which factors do they connect and which domain they belong to. The results are shown in Table 24. The connections in this table are determined either by asking direct questions or by looking for relationships between the factors. The connections could be a driver, a barrier or neutral in the context of sustainability which is also represented in the table. The connections were derived from the interview data by looking for influencing factors and attributes to other factors by using deductive and inductive methods. If a participant stated “our staff does not know much about sustainability” followed by a statement “there are hardly any ideas forwarded regarding sustainability” it can be said that sustainability education is needed to understand sustainability and to act accordingly. Looking at the results in Table 24 it is apparent that the factor “Social Dilemma” has the most connections and therefore most connections to sustainability are within the Culture domain. It seems that common human behaviour, personal rational choice is one of them, has major influences to many factors. Interestingly, the most mentioned factor with connections in the direct question is education rather than social dilemma. It seems education is a more obvious problem whereas social dilemma is more an underlying issue.

As one can see for most factor combinations and influences of all researched factors towards sustainability are named by the attendees. All five selected factors have influences towards sustainability in German SMEs. The weighting of the connections as well as a discussion of the final results can be found in chapter 7 (Discussion of results).

Table 24: Connections between factors

Factor	Driver/Barrier	Trust	Social Dilemma	Education	Institutional Theory	Marketing
Trust (Politics and Culture domain)	**driver**	NA	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found
	barrier	NA	No trust in companies leads to employee decisions only for his/him advantage; Missing trust in governments – sustainability campaigns will fail	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found
	neutral	NA	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found
Social Dilemma (Culture Domain)	**driver**	No connections mentioned/found	NA	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found
	barrier	No connections mentioned/found	NA	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found
	neutral	No connections mentioned/found	NA	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found
Education (Culture Domain)	**driver**	No connections mentioned/found	Education and personal perception need to come together to drive sustainable actions; Education can structure personal perception	NA	No connections mentioned/found	No connections mentioned/found
	barrier	No connections mentioned/found	Business education still promotes maximal ROI and profit; - Missing knowledge leads often to unbalanced behaviour towards sustainability	NA	No connections mentioned/found	No connections mentioned/found

Factor	Driver/Barrier	Trust	Social Dilemma	Education	Institutional Theory	Marketing
	neutral	No connections mentioned/found	Sustainability and sustainable products often too complex to understand – therefore sustainability not practiced – more education could help	NA	No connections mentioned/found	No connections mentioned/found
Institutional Theory (Politics Domain)	**driver**	No connections mentioned/found		Government could support more education about sustainability	NA	No connections mentioned/found
	barrier	No connections mentioned/found	Lobbyism influences society and government for their own advantage; External pressure by cheap products bought by many customers leads to unsustainable decision in local companies too; Sustainable society cannot be imagined - no goal for action	No connections mentioned/found	NA	No connections mentioned/found
	neutral	No connections mentioned/found	Laws and regulation followed but not more because no direct advantage for company	No connections mentioned/found	NA	No connections mentioned/found

Factor	Driver/Barrier	Trust	Social Dilemma	Education	Institutional Theory	Marketing
Marketing (Economics Domain)	**driver**	No connections mentioned/found	Marketing could influence company towards sustainability choices; Advertisement of low fuel consumption cars could influence companies to buy such cars; People with strong opinion and knowledge are not prone to marketing influences	No connections mentioned/found	Good education could influence marketing towards sustainability	NA
	barrier	No connections mentioned/found	Personal choices are made due to influences of marketing (personal advantage, company advantage, society often disadvantage); Marketing idea could easily flavour of the month	Use of sustainable ideas only to sell products	Influences consumerism and unsustainable lifestyle; - Marketing often does not take sustainability problems in export markets into account	NA
	neutral	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found	NA
Sustainable Actions	**driver**	Trust in companies could be a driver of sustainability; Involving staff into cooperate sustainability decision could support sustainability also in society	No connections mentioned/found	Education could lead to sustainable actions	No connections mentioned/found	Marketing has the potential to promote sustainability actions

Factor	Driver/Barrier	Trust	Social Dilemma	Education	Institutional Theory	Marketing
	barrier	No connections mentioned/found	External pressure avoids sustainable decisions; Survival attitude avoids sustainable actions; Easy gaining of value due to fashion products; Greed and egoism avoid sustainability behaviour; Higher profit is appreciate and feels alright; Obsolescence of products is good for company but is not sustainable	Personal perception often avoids sustainable actions despite education; External pressure and customer demands overrides education; Tools for implementing sustainability often not known	Missing trust in government could be a barrier for sustainability	Technical obsolescence god for company's profit but not for sustainability; Marketing is only a sales tool
	neutral	No connections mentioned/found	No connections mentioned/found	No connections mentioned/found	Society's values could be driver or barrier for sustainability	No connections mentioned/found

The different connections show that the Culture domain has the most influence towards sustainability and is strongly connected to the Economics domains. This is also re-elected in the factors where the Social Dilemma has the most connections to all other factors. Again human behaviour has the strongest influence and connections to sustainability. In addition, all factors are research if they are a driver or a barrier for sustainability. This information is derived from the literature review as well as from the interview data.

6.2.3 Summary Interview Data

This section showed the outcome of the interviews and analysed the data gained. The first problem encountered is that the majority of companies were not willing to take part because there is no interest in sustainability as shown on these companies' internet page. 72% of the companies which did not take part do not have or have only a rudimentary sustainability or environmental management approach.

The companies which took part on the interview were first asked what they think about sustainability. It can be summarized that many answers came from the private life experience rather than business life. The lack of detailed knowledge about sustainability was obvious and many participants equalled sustainability with environmental protection. However, only a minority thinks sustainability is not important. When analysing the statements made, nearly 70% of the statement belong to the culture domain and pointed towards human behaviour.

After the analysing the general statements the answers to the five in the literature review determined factors have been analysed starting with education.

Education and knowledge is already rated as important when discussing the general statements and the lack of formal sustainability education could be confirmed by the answers given in the category. The majority of the participants gain their knowledge from public media and internet. These sources are biased by interest groups which could explain the lack of knowledge in certain sustainability areas. In addition, there is a lack of educational offers for sustainability. Education in sustainability allows people to understand the problem and act in a structured way. A lack of education and knowledge leads to unsuccessful measures and strategies in companies. However, in order to use knowledge within a company successful and efficient trust is need which is the next factor questioned.

Trust within companies helps to forward ideas and improves communication. This is a foundation for innovations particularly such outside the core business. The majority of the managers pointed out that they involve staff in decisions but employees had a different view: ideas are not welcome or further processed. This is a problem in many German SMEs and lead to a personal rational behaviour which does not support the company anymore. This is a social dilemma forced by a culture not based on trust. Therefore trust is connected not only to innovation ability but also to social dilemma which is the next factor researched.

The social dilemma factors deals with who is having benefits and advantages by certain behaviour and decisions. Decisions in German SMEs are made for short term benefits and

only a minority takes future issues and society into account. This is an internal factor but social dilemma is also an external factor: customers. Customers decide for their benefits and costs saving and demand cheap products rather than sustainable products which often overrule internal efforts to be more sustainable. Here is another social dilemma problem – the conflict between customer and company: who is doing the first step towards sustainability. The personal rational choice is depend on social values found in a society. Western society focuses more on individual people and their needs rather than the society or community which shows a strong influence of social values. This dilemma could be solved by an authority for example a government which is leads to the Institutional Theory factor.

Institutional Theory's strongest attribute is laws and regulations which force sustainable measures into companies. All participants stated they obey rules and regulations. Institutional Theory is also ways of life in society and it is stated that there is a trend towards buying greener products with the focus on food. Unfortunately these trends hardly reach inside the Germany SMEs which could be due to foreign customers. Furthermore, the German government and its campaign are rated as not trustworthy due to inconsistent outcomes and obvious influences of interest groups. People do not know what a real measure for sustainability is and what greenwashing is. Social dilemma has a strong influence into the Institutional Theory which is also influences by marketing – a tool used by many business interest groups.

Marketing is the fifth factor questioned and is seen as not supporting sustainability. Surprisingly, the majority of the interview participants see hardly any influence of marketing into their company but this could be due, as stated by some participants, subtle and unconscious influences of marketing. Marketing is used as a sales tool and therefore connected to personal rational behaviour where personal or company's short term benefits are most important. This is one barrier towards sustainable marketing. Another barrier is the lack of knowledge which could be identified is a problem for many factors.

Finally future outlooks in combination with a model of a sustainable society have been researched. More than 90% of the participants stated there is a need of strategy change but there were no ideas how this could be achieved. In addition, no one could really imagine how a sustainable society looks like and hardly anyone could imagine that the presented model really works. There is a lack of future planning in the context of sustainability. Visions and missions of German SMEs do not focus on sustainability goals or take sustainability tools and strategy changes into accounts. There are tools which could be used to implement sustainability and two tools, Life Cycle Assessment of Sustainability and

Cradle-to-Cradle, have been introduced. None of the participants used LCA or Cradle-to-Cradle in there company which shows the lack of future sustainability planning. In addition, it was stated that the lack of resources hinders using such tools.

The interview data showed the problems German SMEs face: lack of knowledge, missing trust, lack of resources and social values which do not support sustainability. In addition, connections between all factors could be identified.

6.3 Questionnaires Data Analysis, Processes and Design

This chapter discusses the design of the questionnaires and presents the data gained. This chapter finished with a summary.

6.3.1 Design of Questionnaire

The questionnaire was created to collect additional supporting data as well as to get some opinion from foreign countries. It is part of the triangulation and can be used to validate the interview data. In addition, the first experience of looking for interviewees said that time is an issue. Therefore the questionnaire was designed to fill it out in approximately 10 minutes.

It was created as an online-survey using the “QuestionPro” online tool. The questions were extracted from the interview questions but simplified and reduced to closed question, aiding fast answers. As suggested by Denscombe (2010) to every question a short explanation was added to give some background information. However contact details of the researcher were provided within the questionnaire in order to give the responded the possibility to ask for more background information and give some comments. The questionnaire was send as a link via email to companies which were willing to fill out the questionnaire. In addition the link was also provided in online communities like Xing or LinkedIn within sustainability groups.

Since the questionnaire did not provide any exact information on who filled out the survey, it was not possible to find out if certain companies were answering the questions or simply ignore the questionnaire. This was the main weakness of the questionnaire. In addition, there was the possibility that people drop out in the middle of the questionnaire due to lack of interest or understanding. In order to minimize drop outs the questionnaire were tested with five volunteers prior to publishing and sending the final questionnaire.

6.3.2 Questionnaire Data Analysis

The questionnaire was answered by thirty-four attendees from different countries and companies.

Figure 17Figure 17 shows how many attendees took part and from which country did they come from. There are far more attendees from large enterprises than from SMEs which could point towards less interest of SMEs in sustainability. However, the scope of this research is German SMEs and therefore only the German participants have been analysed. There are 16 participants from Germany where 8 are from SMEs and 8 are from LEs.

Most of the attendees have a higher education and are in a management position which is similar to the attendees at the interviews. Different is that the attendees also work for larger enterprises and not only for SMEs. Therefore different results in comparison to the interview data are expected.

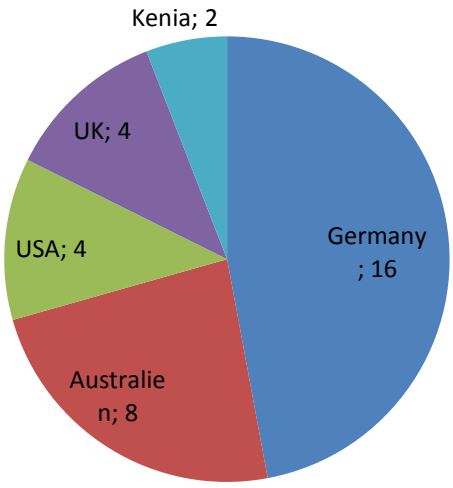

Figure 17: Attendees of questionnaire: counties

Following are the results of the different questions. Only fully completed and only from German participants answered questionnaires have been regarded and used for the analyses.

1. What is your understanding in relation to sustainability? (only one answer could be selected)

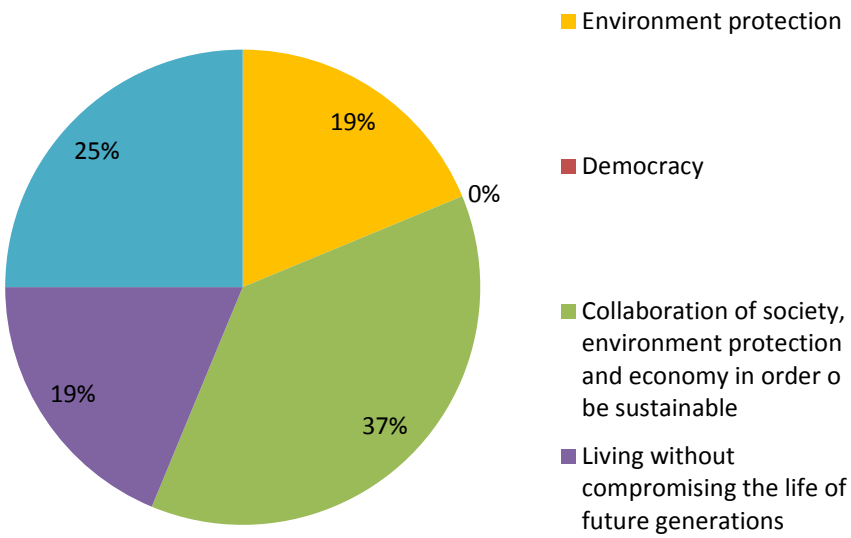

Figure 18: Understanding of sustainability

This question was similar answered from attendees from SMEs and LEs. The majority of the attendees went for the answer green: Collaboration of society, environmental protection and economy in order to be sustainable. This shows that most attendees see the big picture of sustainability. On the other hand democracy is not seen as important for sustainability.

2. According to your opinion how can we achieve sustainability? (rate the possible answers)

The different possibilities could be rated in 5 steps from definitely relevant to not relevant at all. These steps represent a score from 1 (not relevant at all) to 5 (definitely relevant) which is used to calculate a score which is represented in Figure 19.

The answer which were most relevant were answer 2 (Holistic approach…) followed by answer 1 (Purchase of Green Products) In addition to the big picture seen (see above) sustainable products are seen as important for sustainability. Only view attendees think sustainability cannot be achieved.

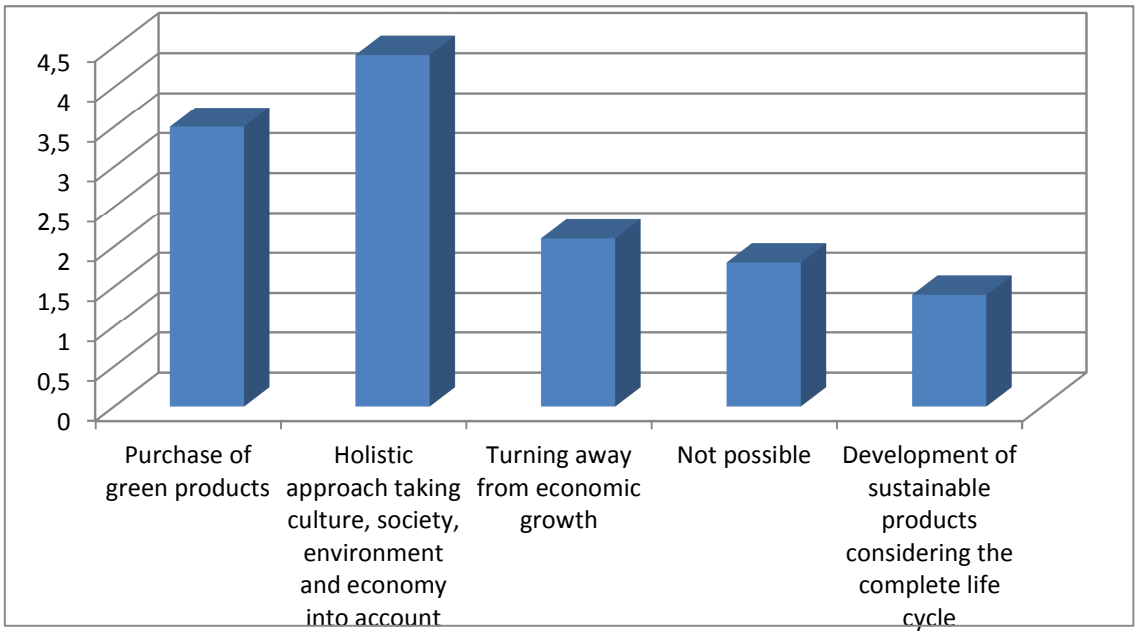

Figure 19: Ways sustainability can be achieved

3. In which way is Sustainability in your company implemented and practiced? (only one answer could be selected)

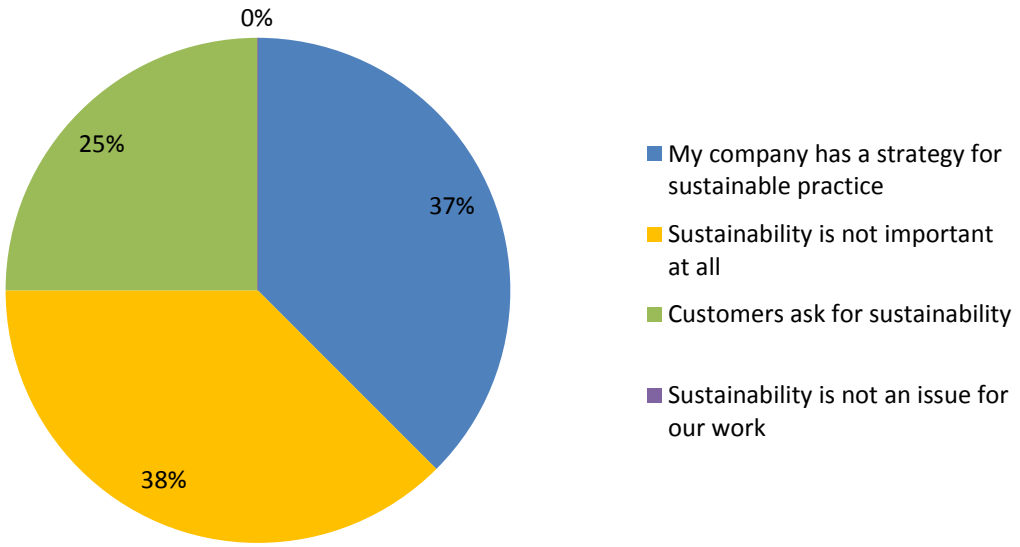

Figure 20: Implementation of sustainability

This question asked for sustainability in the attendees company and most companies have strategy taken sustainability into account. However, there are still nearly a third of the interviewees which does not take sustainability into account at all.

4. Is education in your company in connection with sustainability important or not at all? (only one answer could be selected)

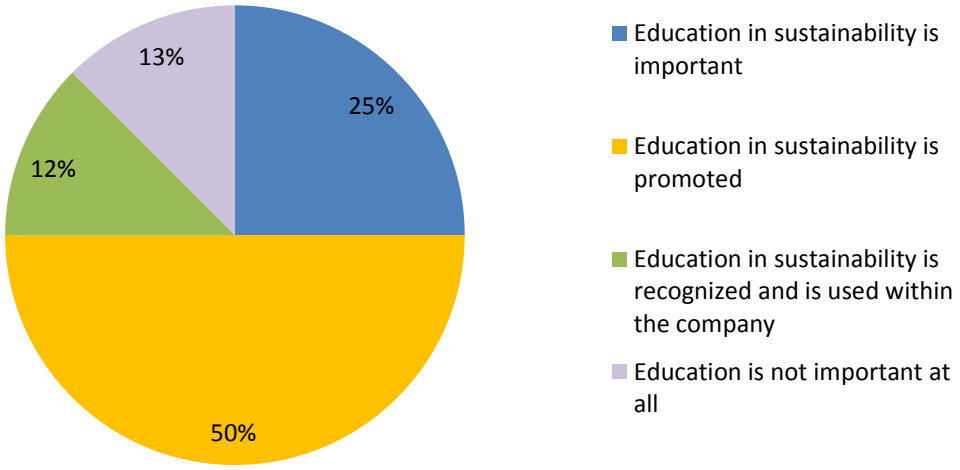

Figure 21: Education in your company

The answers about the question about education get a fairly mixed message. However, most of the companies promote sustainability education or sees it as important. Only 13% say sustainability education is not important at all. Interestingly the 13% which say education is not important at all are from SMEs.

5. How is sustainability promoted in your company in relation to teamwork & partnership? (only one answer could be selected)

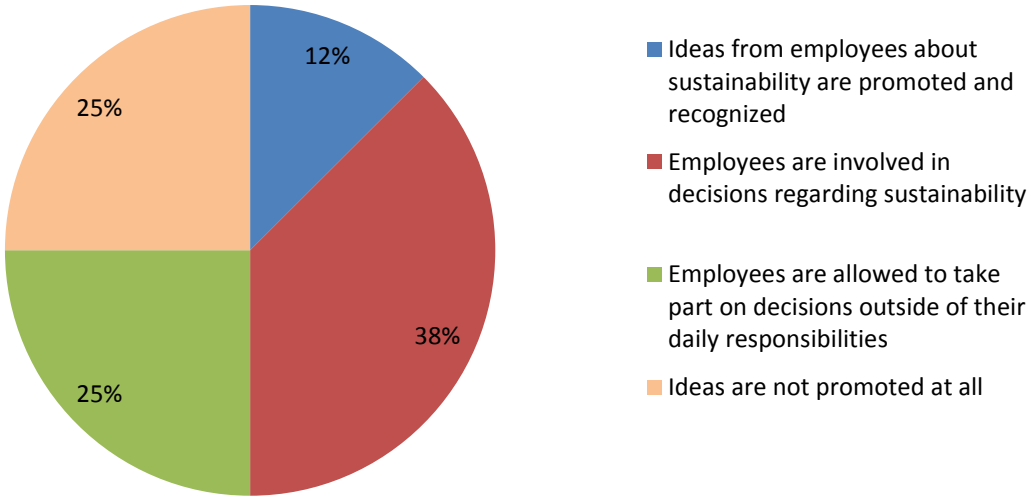

Figure 22: Promotion of sustainability

The answers to this questions focus on employee involvement and the majority vote for the red answer followed by the green and violet answer. However, the attendees from German SMEs focused more on the answer “Ideas are not promoted at all”. Most attendees say there is some involvement of employees in company’s decision.

6. Which of the following points are measures of sustainability in your company? (all answers could be selected)

Questions 6 offered the possibility to add free text when selecting the answer “other”. There are no statements made when selecting others.

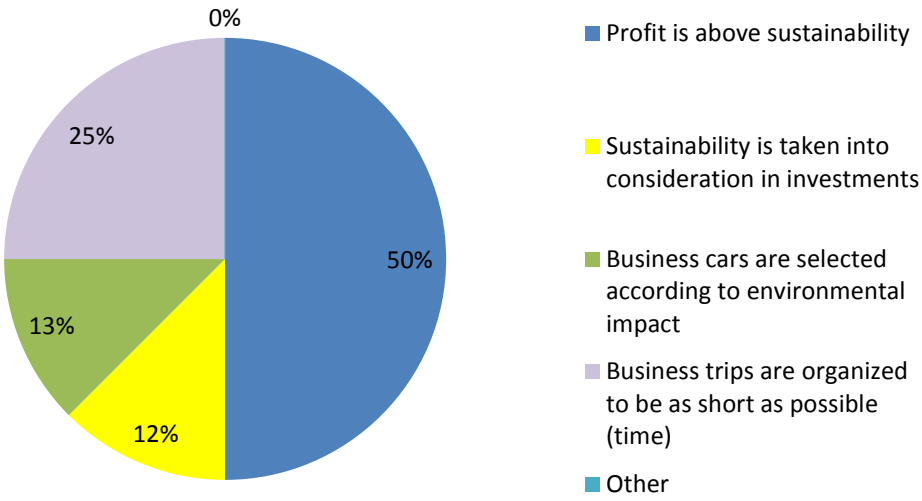

Figure 23: Measures of Sustainability

This question looks to the general attitude of a company towards sustainability. Not surprisingly is that most companies see profit before sustainability. Profit is important for every company since without profit a company cannot survive. However, equally important is to consider sustainability but only 12% take sustainability into account. Nevertheless, the answers are different compared German SMEs with LEs: the participants from SMEs focus more on profit is above sustainability whereas the LEs focus more on sustainability is taken into account. It seems in German SMEs is sustainability less important than in larger enterprises.

7. Which external factors influence your company towards sustainability? (all answers could be selected)

Most participants see external regulations as the major influence towards sustainability followed by customers' demands (see Figure 24). This means if regulations or customers do not demand sustainability it won't be done. There are also some votes towards institutional theory influences ("sustainability is important in your country" and "problems in export markets …").

The focus of the attendees from German SMEs lies on laws and regulations whereas LEs focuses more on customers.

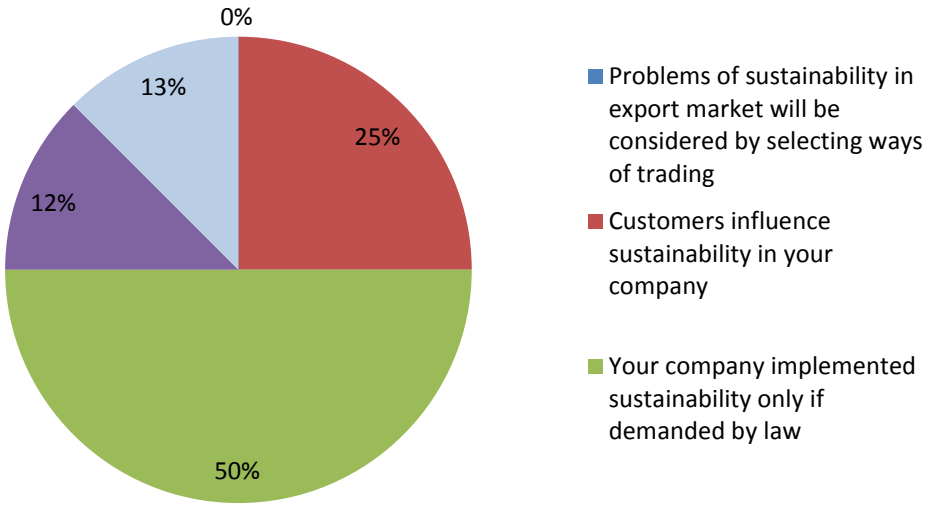

Figure 24: External factors

8. What is the influence of marketing in general towards your company in terms of sustainability? (only one answer could be selected)

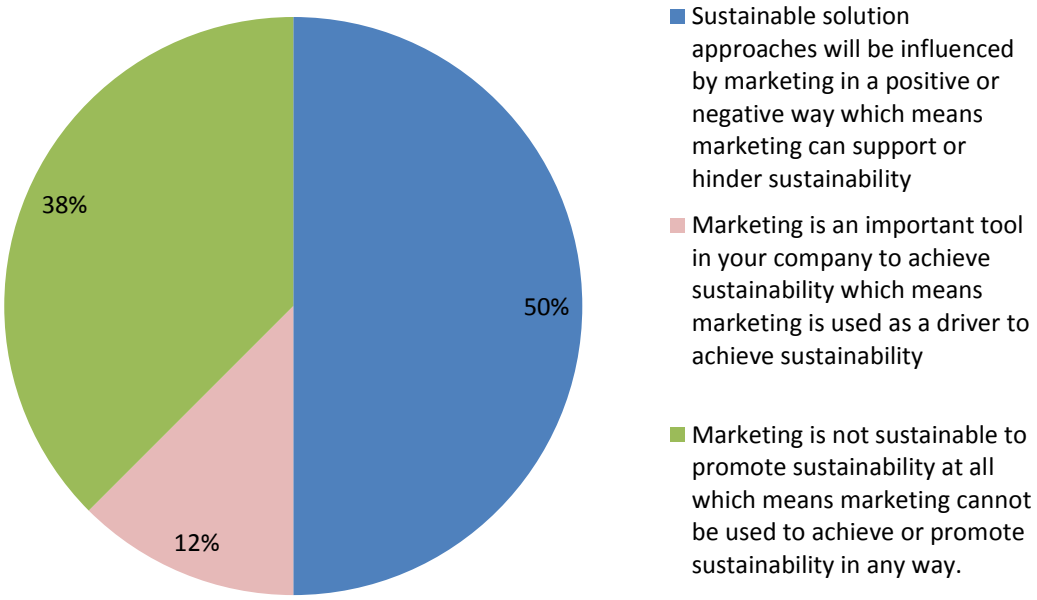

Figure 25: Influence of marketing

This question researches influence of marketing and the focus lies on "Sustainable solutions approaches…" However, the answer "Marketing is an important tool …" is only given by participants from German LEs. The other two answers are mixed by SMEs and LEs.

9. Do you know or use Cradle-to-Cradle or LCA?

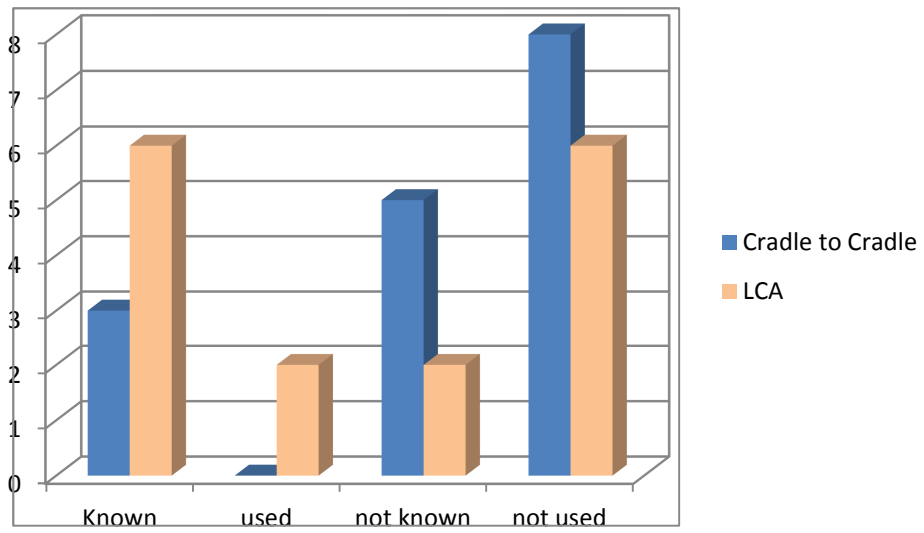

Figure 26: Tools for sustainability

The answers of this question are that more people know and use LCA (Life Cycle Assessment) rather than cradle-to-cradle. However, LCA is used by 2 LEs but not used by all SMEs. Cradle-to-Cradle is not used at all.

10. Business practice and sustainable society

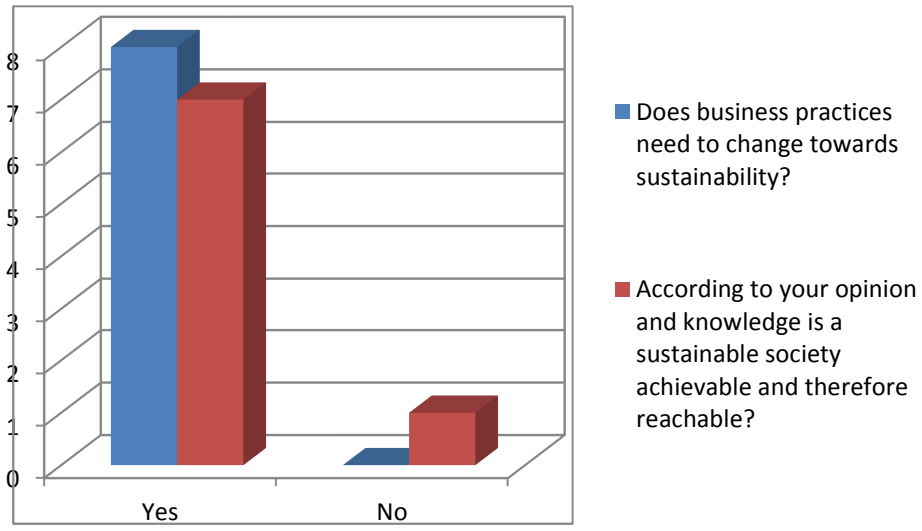

Figure 27: Business practice and sustainable society

These answers are clear from both parties alike – attendees from German SMEs as well as LEs votes mostly for yes for both questions. This outcome is different in comparison to the interview data where most participants do not think a sustainability society is achievable. The reason for this could be that the interview participants get a detailed explanation how a sustainable society could look like which means the interview participants are aware of the complexity and difficulties in connection with a sustainable society.

11. Factors which could influence sustainability in a positive way (all answers could be selected)

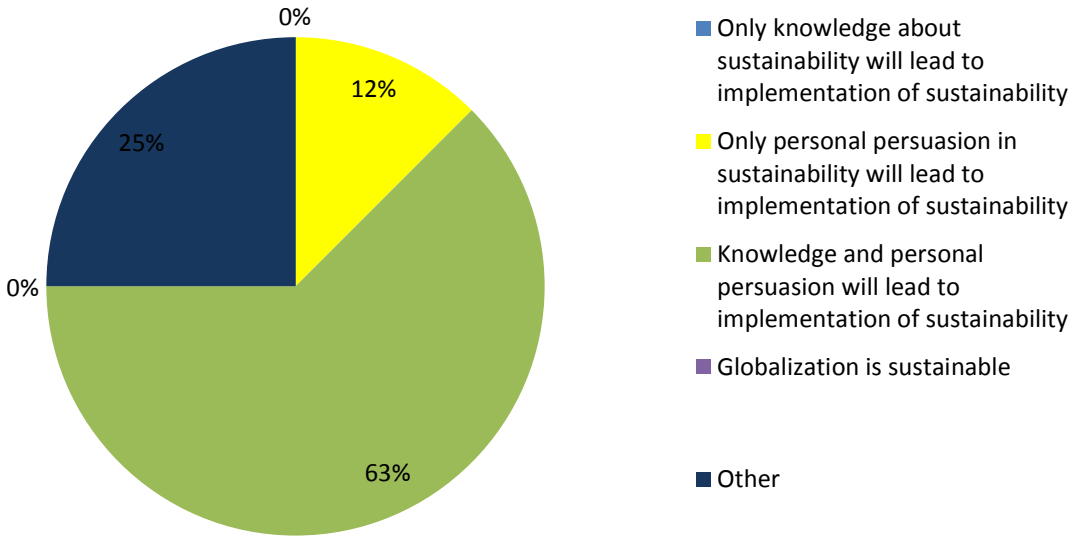

Figure 28: Influencing factors

Statements made when selecting others:

a. Discussions only with comprehensible facts – no emotional discussions
b. Sustainability need to be implemented with hard facts by objective agreements

This question asked for factors which could influence sustainability. Knowledge and personal perception seems to be the most important factor which matches the interview data followed by only knowledge will implement sustainability. In addition, two participants added some statements which were possible to make when selecting others. The statements are listed above. Interestingly none of the participants thinks that globalization is not sustainable. There is not difference between SMEs and LEs with answering the questions.

6.3.3 Summary Questionnaire Data

The data gained in the questionnaire supports the interview data and give valuable insights in differences between large enterprises and SMEs. The main differences between LEs and SMEs have been found in questions 4, 5, 6, 7, 8, 9. Summarizing the differences of these

questions leads to less interests in sustainability and less resources for sustainability of SMEs.

Looking at the answers of the questionnaire the majority of participants sees sustainability as collaboration between society, environment and economy which shows good knowledge about sustainability.

The following question was how to achieve sustainability and the majority answered with “a holistic approach taking culture, society, environment and economy into account”. Again this answers showed good knowledge of the participants. The subsequent question wanted to know how sustainability is implemented in the participants company. The answers were threefold: company has a sustainability strategy, customers ask for sustainability and sustainability is not important. This means only 30% of the company have a sustainability strategy and these are mostly LEs rather than SMEs. SMEs have no sustainability strategy unless customer ask for which is a very reactive way. The next question gives a similar picture when asking for the importance of education. 75% of the participants say education in sustainability is important or promoted. Only participants from SMEs stated that education in sustainability is not important at all.

The succeeding question asked for ways to implement sustainability and the majority stated that employees are involved. However, 25% says that ideas are not promoted which is only stated by participants from SMEs. A similar picture shows the question about measures of sustainability where the majority focuses on profit and only LEs take sustainability in consideration. SMEs focus on profit only. When asking for implementation, influencing factors need to be taken into account too. External factors, ask in the next question, which influence sustainability are laws and regulations (given by all SMEs) and customer influence which is obvious because companies have to obey laws and customers are very important for every company and have therefore high influence. An external factor as well as internal factor is marketing. Marketing could be a driver but also a barrier to sustainability which most participants stated followed by marketing is not sustainable at all.

Another important factor is the knowledge and use of sustainable tools which was asked in the next question. SMEs do not use Cradle-to-Cradle and hardly use LCA for sustainability.

The following questions looked into future needs and important influencing factors. All participants think that business strategy need to change in order to achieve sustainability and the majority sees the possibility of achieving a sustainable society.

Finally the most influencing factor toward sustainability is, according the participants, knowledge and personal perception.

The data showed that LEs have already a developed sustainability culture whereas SMEs do not implement sustainability in a proactive manner.
However, due to the low numbers of participants the validity of data is not very strong and general statements cannot be derived from this data.

6.4 Summary

The data collected and analysed give a good inside in sustainability issues in German SMEs. It can be said that sustainability does not play an important factor for German SMEs and there is also no need seen to implement it.
Interview data and questionnaire data showed that education and knowledge about sustainability is an important driver but most participants had only limited knowledge about sustainability. In addition to education, social dilemma plays an important role and influences all the other factors researched. In this context the research outcome showed that education and personal perception are the most important drivers which is valid for employees and customers alike.
Furthermore, the lack of resources could be identified as another major factor which is a barrier for sustainability in German SMEs. However, the remaining factors, trust, marketing and institutional theory, cannot be neglected because they are connected to all other factors and influence sustainability. If someone has good sustainability knowledge and is also willing to act sustainability but is not involved in companies decision due to lack of trust, sustainability will be left out. Furthermore, marketing influences customers to consume more or act more sustainable. Finally, institutional theory influences the social dilemma, trust as well as education. All these factors are connected to social values because social value determines the society's decision and way of life and sustainability requires the right decisions.
When comparing the interview data with the questionnaire data the influencing factors are very similar but the knowledge of the participants about sustainability is more solid.
Problems occur with the low willingness to attend an interview or fill out a questionnaire. There are several reasons for this as pointed out in this chapter but one is definitely the lack of interest in sustainability.

The questionnaire showed that there is a significant difference in managing sustainability in LEs and SMEs. This has been expected and data gained in the literature review could be strengthened. In addition, ideas found in the literature review could be verified with the data gained but also new ideas have been found.

The connections and ideas found are further discussed, evaluated and analysed in chapter 7.

Chapter 7: Discussion of Results

7. Discussion of results

This chapter discusses the outcome of the Literature Review, the Interview data and the Questionnaire data. It compares and evaluates these data, show similarities and differences. It lays the foundation for answering the research questions.

The interview data showed that most interview participant showed a lack of understanding of sustainability. This was shown for example by not identifying all columns of sustainability or the total absence of any understanding towards social sustainability.
Participants of the questionnaire have a better understanding of sustainability issues. However, the focus was often more towards environmental protection and did not take the economic and social part into account. One issue which could explain the lack of understanding is the complex and dynamic nature of sustainability as outlined in the literature review. Even some experts have problems to understand sustainability with all its dynamic connections and attributes (Spangenberg (2005), Marcus (2012)). On the other hand, education in sustainability could help but sustainability education is just evolving and, if seen the difficulties to find agreeable definitions and measure of sustainable issues, offering the right contents in education will be very difficult. Literature has found out that education is a key factor for implementing sustainability in a company (Jones and Clarke-Hill et al. (2007), Markulev and Long (2013)). Interview data verified this view and pointed towards lack of formal education in sustainability. However, interview data as well as questionnaire data emphasised that sustainability education is not supported or promoted in the majority of German SMEs. This point was not addressed by literature and is therefore a new insight.
Furthermore, knowledge how sustainability could work, does not lead to sustainable behaviour as seen in many communistic countries because an important factor is human behaviour, described here as personal rational behaviour which leads often to social dilemmas (Dam and Apeldoorn (1996), Shove (2010)). Participants of the interviews and questionnaire see personal perception which is connected to social dilemma, as one of the most important drivers or barriers. Personal rational choice and personal perception are depending on social value. This means, in order to achieve sustainability, social values need to change so people make decisions towards sustainability.

However, behaviour and values are also influenced by values developed centuries ago like the idea of controlling nature, which derived, according some philosophers, from putting humanity prior environment and nature (Wapner (2008). Therefore, knowledge of sustainability leads not necessary to sustainable actions and behaviour without changing values and focusing on the wellbeing of society. History showed that this will be extremely difficult to achieve which was shown in the collapse of the communistic countries. (van Dam and Apeldoorn (1996), Müller and Altvater et al. (2012), Naderi and Strutton (2015)).

Another problem showed by the interview data is that existing knowledge about sustainability is often overruled by customer demands. Customers' decisions are influenced by social value which is a social dilemma problem. Social dilemma influences companies internal as well as externally and both sides have to be addressed. Interview data verified the importance of customers and their influence towards a company's strategy and sees it as one of the external main drivers. Contrary questionnaire data shows that laws and regulations are the main driver and customers are seen as less important. However, customers' demands are important which are also depending of their values and background. In this context, most Germany SMEs compete in export market outside Europe and these customers are particular price sensitive and have different values than home customers. Therefore, German SMEs face, according to the interview participants, stiff competition mainly from Chinese and other Asian companies. These companies can produce cheaper than the German companies and consequently many German companies are forced to reduce prices which lead to a kind of survival attitude. This attitude is a major barrier for implementing sustainability. Most of the interviewed companies would follow customer demands towards sustainability but these are rare particularly in emerging markets like South America. Literature argued that global development and growth is hardly sustainable. More localization is needed which would be a major paradigm change for German SMEs because many SMEs have their markets abroad. This global market approach is used to force economic growth and it will be extremely difficult to change since growth means more profit and market influence. This is maybe good for a company or a country but has many disadvantages for others (Peach (2012), Park (2012)).

Coming back to an important external factor already mentioned above: laws and regulations. Interview and questionnaire data pointed out that laws and regulations are followed. In addition, interview data pointed out that implementing laws and regulation does not lead to strategy change. Literature pointed in the same directions and argued that implementing laws and regulation without adapting company's strategy will not lead to sustainability. It

has been argued that implementing regulations are only reactive which often prevents to go further or change strategy (del Brío and Junquera (2003), Klewitz and Hansen (2014)). However, regulations do improve environmental protection even if not merged with strategy.

The two last factors, customer demand and laws and regulations are often opposing to each other, particularly if the customer is from a foreign market. There is a trend to standardize markets in order to avoid such problems but this is threatening culture and supports consumerism.

Interview data also pointed out that sustainability is somewhat important in Germany and see also some trends towards buying greener products in Germany. Those companies which sell products mainly to private customers in Germany see this factor as important but companies which export most of their products are less influenced. In this case personal rational choice leads to more sustainability without compromising the company's wellbeing and profits. It can be said a society which values sustainability supports sustainability in companies. However, companies are able to influence customers, using marketing to act more sustainable which is also said by literature (Reutlinger (2012), Prymon (2013)). However, according to the interview and questionnaire data marketing is not seen as having larger influences in most companies. Though, two participants pointed out this influence is often subtle and unconscious and therefore difficult to grasp. On the other hand, traditional marketing supports consumerism which also influences customer demands and therefore the companies. Literature argued that marketing is an important strategy function of every company and is used to raise profits. However, marketing could be used to promote sustainability but only if heavily regulated and appropriate knowledge about sustainability gained. This leads again to personal rational behaviour which is looking for the easy way to gain advantages and not taken others into account (Kütting (2007), Jones and Suoranta et al. (2013)). The factor marketing belongs therefore to two sustainability domains: economics and culture and in some case (government campaigns) also to Politics.

Another factor discussed in literature is the involvement of the staff into sustainability decisions. A company culture based on trust and involving employees in important company decisions will support forwarding ideas and innovations. However, as stated by most of the interview participants there are only few ideas towards sustainability given. Moreover, according to most managers attending the interview employees are involved in important decisions which would be the foundation to implement sustainability innovation but the opinions of the non-managerial staff is slightly different but changing.

The lack of willingness of manager in German SMEs to involve the staff into decisions seems to be a problem. If this is only a German problem cannot be said but it seems not all countries have similar issues (Bliesner and Dreuw et al. (2011)). Trust is not only important within a company but also in extern organisations and institutions. Trust is missing in the government which leads to disbelieve in government campaigns, questioning of regulations mad lack of innovative ideas in companies as interview data stated. On the one hand, the loss of trust is mainly caused by failed large project and the slow renunciation from democracy. This renunciation from democracy is caused by powerful interest groups manly from the industry which is also known as lobbyism. Lobbyism is often seen as avoiding decision for the society in favour for some larger enterprises or even other government in the sake of economic growth (Georgantzas and Contogeorgis (2011)) On the other hand, trust can be also an internal factor which is discussed above. Trust is a factor which belongs to the Culture domain which is a strong driver or barrier for sustainability.

Another strong driver or barrier is resources. Literature pointed out that SMEs have a lack of resources, financial and human (Brilius (2010)). Interview data verified this view particularly in the context of human resources. SMEs have often no one who is a specialist in sustainability which is also true for marketing. This lack of resource creates internal pressures and often, the knowledge of sustainability used privately cannot be implemented within the company. However, literature offers a solution to this problem: networking. Networking is used to gain customers but is could be also used to reach external resources and information exchange. This can support innovations and sustainability (Jones and Suoranta et al. (2013)). Innovations are necessary to create sustainable products and interview data showed that this is an important factor. Interview participants rated products specification which range from recycling, long lasting products till product packaging as very important. Product specifications and sustainable design strategies are essential factors for achieving sustainability. Especially larger enterprises have introduced product development strategies with sustainability in mind (Heijungs and Huppes et al. (2009), Braungard and McDonough (2010), Vajna (2014)). However, if possible profit maximisation is still in focus and sustainable measures are often weakened or left out in order to earn more which showed the interview data as well as the data from the questionnaire. Again, personal (or business) rational behaviour could avoid products developed according sustainability measures.

Future Planning and Tools

The answers to the sustainability tools had a clear outcome – hardly any tools like Life Cycle Assessment for Sustainability or Cradle-to-Cradle are used and other tools have not been named. The answers in the questionnaire point in the same direction. The main reason for this is the lack of resources in most SMEs. In addition, detailed knowledge about these tools were also not present which could be also a resource problem since SMEs have less resource to send employees to a trainings course. Furthermore, the need to use such tools is not really seen. Literature pointed out that such tools are necessary in order to achieve sustainability but factors like knowledge or scarce of resources are not taken into account (Mádl (2011), Braungard and McDonough (2010)).

The answers of the questions about the future pointed towards changes in economic as well as society. The majority of the interview participants as well as the questionnaire participants could name necessary changes in order to achieve sustainability but only a few could explain these changes in more detail. In addition, most participants could not imagine the presented sustainable society nor could visualize how such a society could look like. A sustainable society could be seen as the final goal of the sustainability game and should be therefore part of a company's vision and mission. The lack of these is a sign of missing long term planning. This is opposing to the reputation of German SMEs and could be due to external pressure and survival attitude.

Naturalistic Observation

Some of the research factors pointed towards connections and influencing attributes in other areas of life and could lead to some additional explanation. The researcher's experience and daily life observation is used to add additional data which adds insights in the sustainability debate.

The German government follows many projects which should support sustainability like the energy turnaround, support of electric cars, bonus programs to exchange old fridges or cars and laws and regulations for fishing limits or waste treatment. However many of these programs seem to be mainly greenwashing or are not working properly. Most of these programs support economy rather than sustainability. The German government focuses heavily on economic growth and is willing to sacrifice democracy. A typical example would be the free trade agreement with Canada or USA. These agreements should make it easier to

sell products but consumer protection will be weakened. In addition, more food products will be shipped around the word, which is not sustainable when seen the energy consumption of transportation and the problems smaller farmers will face. Economic growth seems to be a dogma in many Western countries and governments tries to throw money on this issue or weakens regulations to give companies more sales potential.

Germany sees a trend towards buying more sustainable or organic products. Unfortunately these products are more expensive than its standard counterpart which opens the door for misuse of organic or sustainability labels. The major problem here is the personal rational decision. If one can earn more money it will be done. This typical human behaviour is feed by parsimony, enviousness and hunger for power and control.

The researcher was growing up in the GDR, which was a communistic country. The communistic idea is based on personal decision for the advantage of the society rather than for personal advantage. However, most people decide for their personal advantage. This was one of the major problems in the communistic world and was one factor which leads to the collapse of the communistic system. According to Overmann (2001) the economic collapse was based on wrong decision from the government but also on personal rational decision of workers who put their needs before the need of the society. Of course there were many other reasons which led to the collapse of the communistic system but these are outside of the scope of this research.

Similarly hard sustainability is also based on decisions for the advantage for the society rather than personal advantage. Therefore sustainability will face, in the context of human behaviour, similar problems than communism phases.

7.1 Sample size and secondary data

The results discussed above are based on a fairly small number of respondents due to low response rate. Only twenty-three companies took part which is a considerably low number of SMEs in comparison to the total of SMEs in Germany of approximately 2, 2 million (Statistisches Bundesamt (2012)).

Therefore it could be argued if the results discussed are valid and of any value. It can be said that such a small sample number cannot generate general and overall valid data. However, the researcher’s experience with working with small companies’ points in the same

direction and growing SMEs faces similar problems than the one researched in this research (Neugebauer (2009).

Moreover, this research also looked at all companies which refused to take part and evaluate their internet pages but also internet pages of NGO which deal with SMEs as well as with Business Ethics and sustainability. This secondary data could support the findings of the interview data since hardly any evidence of sustainability measures or CSR could be found. The very large number of 227 SME internet pages gives a far better overview than the small number of interviewees. There is a high possibility that more interviews would not change the data gained significantly taken the results of the internet page evaluation into account. This statement could be also supported by observing the design of the internet pages evaluated. Most internet pages have a modern design which points to an active use of the internet pages as a marketing tool. Therefore it could be argued that the information given on these pages represents the company's beliefs and values and these supports the interview outcomes very well.

Summarizing this section, it can be said that the outcome of this research represents the values, believes and understanding of sustainability of a large number of SMEs taken the outcome of the interviews as well as the secondary data gained by the evaluation of the internet pages as well as the questionnaire data.

7.2 Summary and Circle of Sustainability

The connections found between the factors are shown in Table 24 in chapter 6. Most of the factors have connection to another factor which makes sustainability measures and action difficult. In addition, all factors could be also a driver or a barrier for sustainability. In the context of German SMEs there are mainly two research fields which have significant influences towards Germany: social factors towards sustainability taken economic influences into account and the sustainability engineering with focus on products and connected service. As the interviews have shown many attendees know the characteristics of a sustainable product but are unable to implement it due internal and external barriers.

The Table 24 shows the drivers and barriers of sustainability focusing on the five factors the research has selected. These factors are derived from the interview data represented and discussed above.

In addition, the influences of the connection have also been researched to find which factor is a driver or a barrier. Some factors could not be identified as a driver or barrier by the

attendees but this does not mean that these factors could not be drivers or barriers in other circumstances. However the results show how complex sustainability is and taken all factors (see Table 15) into account is hardly possible within one research project.

All factors, statements and connections can be assigned to domain or subdomain (Circle of Sustainability). The domain or sub-domain can be weighted according its numbers of statements or the strength of influence. The statements are already matched to a domain or a sub-domain in the data analysis chapter. The factors found and research are matched to a sub-domain by analysing which area of sustainability this factor will influence and how much does a factor influences sustainability which is taken from the interview and questionnaire data. The following table matches the factors with the Circle of Sustainability domain (Table 25). The weighing in this table is derived from the interview and questionnaire data. In addition, data from literature is also taken into account. The highest weighting is 10 and lowest 0. It needs to be taken into account that the weighting of the influence of the research factors is partly subjective and other researchers could have different rates.

In addition to the rated factors, the statements made to the questions about general attitude towards sustainability and Future outlooks are also rated (see Figure 13 and Figure 14) in the same way as the factors. The rating of the sub-domains of the different statements is shown in Table 26. The ratings are calculated in the following way: The number of statements has been counted separate for “attitude towards sustainability” and “future outlooks”. The highest rating is set to 10 and all other figures are adjusted accordingly. The result can be seen in the Circle of Sustainability graphic (Figure 29). The figure shows a clear focus which lies on the Culture and Economic domain which is not surprising since the focus was on sustainability in German SMEs. The largest influence in sustainability is Culture which covers human behaviour and social values. The factor relating to this domain is social dilemma or rational personal behaviour. This typical human behaviour has major influences to German SMEs. This behaviour is an internal as well as an external factor. On the one site, this factor explains behaviour and decisions of managers and staff within the company. On the other side it explains customer behaviour which also influences SMEs heavily. The customer influence needs to be seen globally since many German SMEs focus on foreign markets and therefore different values can be expected. As mentioned by some participants, emerging market are important markets for German companies and customers there focus on price rather than quality. Furthermore, education, knowledge and trust are

important parts of the culture domain and is seen as an important factor to understand sustainability and to act in structured way. Trust is also a part of the Politics domain by focusing on governments.

In addition to this culture domain, external economic pressure from other companies has major influences.

Finally the economic domain has major influences towards sustainability in German markets. The most important point is resourcing and production followed by consumption and use. The focus here is on resource efficiency as well as sustainable product design, which is seen as important ways towards sustainability.

Summarizing the outcome German SMEs are influenced by social values represented by the culture domain which leads behaviour, external markets, knowledge, customer demands and resource efficiency. Moreover, trust within the company as well as to the government support sustainability but trust is often lacking and can be seen more as a barrier for German SMEs. In addition, the research found out that serving foreign markets, which means dealing with foreign culture often prevents implementing sustainability due to costs pressure and fierce competition from cheaper producing companies. This is a problem many German SMEs face. The competition with cheap producing companies leads to a survival mode and prevents implementing sustainability. Even knowledge or personal perception is overwritten by this issue. However, lack of knowledge how to use resources or to differentiate a product makes the problem worth. Solution could be found but personal perception as well as personal rational choice of the management prevents solutions as well as trust (see discussion above). It can be said that external factors, often seen as given, influences internal factors. Many SMEs are not able to “escape” these external factors because they cannot see any solutions. Successful SMEs using knowledge as a main resource which is an advantage but new business approaches like PSS is hardly used.

It can be said the blend of external factors and internal factors in the connection to all five research factors, marketing, trust, social dilemma, institutional theory and education prevent in many German SMEs sustainability. However, the same blend, used in a different way, could also drive sustainability, provided there are supporting values to sustainability.

The following points show the key findings and results:

- All five factors (education, institutional values, trust, marketing and social dilemma) have influence towards sustainability implementation in German SMEs
- The most influencing factor is social dilemma seen as an internal and external factor

    - Internal factor: behaviour and opinions of staff
    - External factors: influences of customers and other stakeholders
- German SMEs focus often on foreign markets which focus on price and not on sustainable measures
- Education is a very important factor and needed to act in a structured way. This factor is often overwritten by external factors like customer demands
- Formal education in sustainability is rare in German SMEs
- Trust within a company can create and innovative culture in the company and helps to implement sustainability measures. Many German SMEs have not a culture based on trust
- Missing trust into government leads to disbelieve on sustainability campaigns
- Sustainability ideas of staff is often not considered within the company
- Most German SMEs do not see any advantages or need in implementing sustainability
- Many participants follow sustainable practice in their private life but not within the company
- Some German SMEs have an survival attitude due to external pressures which prevent implementing sustainability measures
- German SMEs which have a traditional family background hardly implement sustainability measures
- Regulation and laws which points towards sustainability are usually implemented in most German SMEs

The above points name the findings in a nutshell as an overview. All findings are further discussed in chapter “7 Discussion of results”.

Table 25: Factors matching Sub-Domain

Factors	Domain/Sub-Domain	Rating	Explanation
Education and knowledge	Culture – Enquiry and learning	8	Education is an important diver for sustainability. According the interview data it is the factor with the second highest influence. Education is part of the Culture domain since learning is anchored in this domain.
Marketing	Economics – Wealth and Distribution	2	Marketing is a complex tool and is the interface between customer and company and therefore belongs to two domains: Culture and Economics. Marketing is rated fifth in terms of influence.
	Culture – Belief and ideas	2	
Social Dilemma	Culture – Belief and Ideas, Identity and engagement	10	Social Dilemma is part of the Culture domain since it describes typical human behaviour. This factor has the highest influence towards sustainability according the data collected.
Institutional Theory	Politics – Organization and governance; Law and justice	6	Institutional Theory is part of the Politics domain since it describes accepted behaviours, laws and regulations within a society. Regulations are the most important part of institutional theory and has the third highest influences to sustainability
Trust	Economics – labour and welfare	4	Trust is part of many parts in live and therefore belongs to several domains where it has influence. Trust is important when new measures, in society and well as a company, need to be implemented. Missing trust can fail such attempts. Trust is the fourth highest influencing factor.
	Politics – Dialog and reconciliation	4	
	Culture – Identity and engagement	4	

Table 26: Rating Sub-Domains for statements

Sub-Domain	Rating "attitude toward sustainability"	Rating "future outlooks"	Researched Factors
Culture - Belief and ideas	3.5	1.3	10
Culture - Enquiry and learning	5.3	1.2	8
Culture - Identity and engagement	10	6.9	10
Culture - Wellbeing and health	0.5	0	0
Ecology - Emission and waste	2.4	0	0
Ecology - Flora and fauna	1.9	0	0
Ecology - Water and air	1.9	0	0
Ecology- Materials and energy	2	0	0
Economics - Consumption and use	1.3	2.8	0
Economics - Exchange and transfer	0.4	0.4	0
Economics - Labor and wealfare	0	0	4
Economics - Production and resourcing	3.6	10	0
Economics - Technology and infrastructure	1.6	2.8	0
Economics - Wealth and distribution	0.1	0	2
Politics - Dialogue and reconciliation	0	0	4
Politics - Ethics and accountability	2.6	1.4	0
Politics - Law and justice	0.7	0.7	6
Politics - Organization and governance	0.4	3	6

Figure 29: Circle of Sustainability – Rating for German SMEs

7.3 Creating Theory

When comparing the discussed results of the Literature review, the interviews, the questionnaires and the observation some clear factors and connections emerged.

As determined in the section above the most influencing factor is social dilemma or, in connection with this factor, personal rational choice and personal perception. This "soft" factor and its connections seem to influence sustainability.

As already seen in the Literature Review as well as in the chapter above, there are many technical documents with clear messages how to develop, design, recycle and reuse a product or how to set-up a sustainable service. These technical solutions are often based on older ideas but discussed in the context of sustainability. These ideas are helpful but do not work if nobody **wants** to implement these ideas. This "want" is the key which is connected to the social dilemma. There are some approaches already discussed (see Peach (2012), Chen and Perc (2014) and Zelenski and Dopko et al. (2015)) which suggest value and behaviour change. The main focus of these approaches is to change behaviour towards cooperation, to put society first and then personal needs. This approach is fairly similar to the idea of communism developed by Marx and Engels (1848) – society is in the focus and manufacturing assets belong to the society. This approach failed massively shown by the collapse of the communistic block. The failure has several reasons but one major factor was social dilemma. There was education for communism but no personal perception. In addition, people want to possess goods, of course more than the neighbour. This is very similar to the problems sustainability face.

German SMEs have the same social dilemma problem. In addition, there are external forces like fierce competition or customers which are only interested in low prices rather than a long lasting quality product not to speak about sustainability. SMEs have often the disadvantage of scarcer resources which could lead to a survival attitude. It is apparent with such an attitude the own survival is in the focus and not advantages for the society.

In comparison to larger enterprises SMEs have fewer resources especially to promote sustainability. As discussed by Meynhardt (2014) larger enterprises use often sustainability for marketing and are not more sustainable than many SMEs.

Therefore the theory to Sustainability in German SMEs is as follow:

Most German SMEs do not implement sustainability due to lack of advantages for themselves. External pressure and survival attitude focus on personal rational decisions

which are not sustainable for the society. In addition, many SMEs have not the resources to promote sustainability in comparison to larger enterprises.

The theory above shows also some kind of re-bounce effect since someone needs to start to implement sustainability – customer or the SME. No one really wants to start implementing sustainability due to expected disadvantages and if one starts the behaviour of the other often prevents further steps. This leads back to the rational personal behaviour. On the other hand resources need to be defined newly for SMEs. The lack of resources does point mostly towards manpower and finances rather than knowledge and experience. This resource could replace partly other resource but a paradigm change is needed here. In addition, literature is needed which gives SMEs ideas how to use their resource in a different way.
It can be said that the theory above points towards may solvable problems, which lay mainly in personal value and the way business is done in the world.

Chapter 8: Conclusion

8. Conclusion

This chapter concludes, compares and evaluates the data from the interviews as well as from the questionnaires. In addition, it uses the data to answer the research questions.
There are some suggestions to implantation using the data found; a summary which discusses the outcome as well as problems of the research project.

8.1 Conclusion

A review of the research results showed that many found factors could be confirmed but also additional knowledge about the factors could be gained.
This research could show that the German SMEs are not really involved in sustainability measures and strategy creating. The five selected factors have a major influence into sustainability in SMEs. Three main drivers and influencing factors could be determined which again influence the five selected factors: education, personal perception and external competition. The personal perception is influenced by the society as well as marketing and by the company's historical strategy. It was apparent the traditional family companies have hardly any idea about sustainability whereas newer or larger companies are more open towards sustainable measures. The results of the research cannot be generalized but the focus by implementing sustainability need be on education, opinion building measures (marketing, campaigns) and on external factors like competition from cheap producing countries. In addition, institutional theory (Politics domain) can support or hinder sustainability in SMEs as well as in the society. This lead to a re-bounce effect since social values influences sustainable behaviour. Sustainability can only be successful if all factors are taken into account.
This research found more than those five factors as seen in Table 15 but all the factors could not be researched but need to be taken in consideration.
Data was gained from companies which do not take part on the interviews. The majority of the companies did not promote any sustainable or environmental measures on their internet site. Most of these companies were traditional family companies. It can be concluded that more traditional companies have less interest in sustainable strategies or environmental protection. Another factor is the market served. Market which face stiff and price sensitive competition do not support sustainability and therefore companies which serve such markets have no interest in sustainability. All these facts show the interwoven and dynamic factors

which can and will influence sustainability. The dynamic and connection shown in Table 24 shows that the attitude “I do not want to start first to do something, others need to do something first” is a major barrier in sustainability.

Taken the found factors and connections into account the answer of the research question will be as follow:

1. What are the factors and values internal and external which influence the behaviour of the SMEs in the context of sustainability?

The change of social values could have an impact on the meso-environment of German SMEs but so far customer demands and stiff competition avoids often sustainable measures. Many German companies serve foreign markets and demands for sustainable products are low. However, the most influencing factors are knowledge and personal education for employees and customers alike. Sustainability cannot be achieved if only one site of the business (company or customer) acts sustainably. In addition most companies act in a global world which also means that in all countries in the world sustainability measures need to be implemented otherwise it will be extremely difficult to achieve sustainability.
Furthermore, most attendees could not imagine the introduced model of the sustainability nor could they say how a sustainable society will look like. The research identified that it is important to have a commonly agreed model of a sustainable society which can be used as the final goal. This is important to design business and market strategies in the long run.

2. In which way will SMEs implement sustainability in their company, which tools and resources do they use and what are the drivers and barriers taken social values into account?

This question is difficult to answers. The drivers and barriers identified are education, social dilemma (employees and customers), lack of resources and trust. There is no clear strategy mentioned how to implement sustainability into German SMEs. However, the focus of most attendees was on sustainable products taken resources, quality and recyclability into account. If a product lasts much longer, can be upgraded and easily recycled a new strategy is needed since the focus of the business need to shift more towards service. It seemed that

most attendees are not aware of this fact. On the other hand, competition is a strong factor avoiding implanting sustainability. In addition, personal perception (my business is still doing well) can also be a barrier but also a driver. Another factor which could be a driver or barrier is customers. If many SMEs want to implement sustainable measure it is highly depending on customer demands. It seems that the strong focus to foreign markets is more a barrier than a driver for German SMEs.

Contribution to knowledge

The research is contributing to knowledge by finding out important influencing factors, their connections and influences from external factors into German SMEs.

Factors identified in the literature review, education, trust, institutional theory, social dilemma and marketing, have been researched with the focus of German SMEs and social value. Connections between these factors have been found and the influence of social value to all factors as well as the connections between them has been proven. In addition, lack of resources and influencing customers from foreign markets are influencing factors. The letter one is a specialty of German SMEs since many SMEs have their market abroad.

Another factor is trust in companies which is not very strong in German SMEs which can be connected to the way of work in Germany.

Finally German SMEs do not plan taking sustainability into account. In addition, there is no ideas how a sustainable society should look like which means a future sustainable model is missing.

This knowledge is unique and can be used to create working strategies towards implementing sustainability strategies. In addition, it found out the general state of sustainability in German SMEs which are the backbone of Germany’s industry and therefore have heavy influences towards sustainability. As shown in the chapter above there is a lack of understanding of and will to implement sustainability which is the foundation for actions and further research.

Furthermore, this research use unique and seldom use research methods like Engaged Theory and the Circles of Sustainability.

8.1.1 Limitation of the research

There are some limitations to this research. The first limit was the selection of the five factors. There are many more factors which influence sustainability but the research has to select a small number due to feasibility (time). In addition, the response rate was very low which made it difficult to gain data and the research needed to accept the 23 attending companies due to time constrains. The attending companies had a kind of interest in sustainability which means that companies which had no interest in sustainability did not take part on the interview. These facts lead to some bias in the data towards a positive attitude in sustainability. However, as in section "7.1 Sample size and secondary data" discussed the secondary data gained by evaluating the internet pages of those companies which refused to take part, supports the findings of the interviews. The findings of this research are valid for a large number of SMEs in Germany.

8.2 Summary

The research showed important factors, connections, driver and barriers for sustainability within German SMEs. This knowledge is important to determine best ways of implementing sustainability in SMEs as well as in society. It shows the difficulties researchers and politician as well practitioners face when implementing or researching sustainability.

Findings of this research include the influence of foreign markets towards the SME which is a common factor in Germany since many SMEs have their markets abroad. These markets appear not to drive sustainability since many customers in these markets focus on price. Quality or sustainability is not on the forefront of customer demands anymore which raises pressure to many German SMEs. Those SMEs which do not differentiate with high sophisticated technology or products have the largest problem which often leads to a survival attitude. This attitude, one of the finding of this research, prevents implementing of sustainability.

Sustainability research in many Western countries including Germany seems to difficult due to less support by companies. It was apparent that many research papers which needed to gain data by conducting interviews select African or Asian countries rather than European or North American countries. This seems to be a lack of CSR towards students and the academic world in general. There is often an attitude present "Sorry for not taking part, but we wish you good luck with other companies". This barrier together with lack of knowledge

and external pressure from cheap producing companies seems to be the major problems in sustainability.

Taken all the finding above into account a sustainable society will be very difficult to reach. A famous failure of a similar approach was communism (Karl Marx, The Communist Manifesto, 1848). This approach had some ideas of a sustainable society included but failed because of human misfits. The final result was seen by the demise of the communistic block in the 1990s.

Change our behaviour and create a sustainable and liveable society which will have a future. SMEs in Germany can only play a part of it but consumers as well as competition from abroad need to play the sustainable game too.

Chapter 9: Future research recommendations and Implementations

9. Future research recommendations and Implementations

9.1 Overview

Future research could focus on implementing sustainability education in schools and well as colleges and university and how the education should look like. In addition, strategies for global trading and service exchange need to be explored.
Furthermore, the development of a model of a sustainable society which is commonly accepted and taught needs to be created. There are still many factors (see Table 15) which need to be research and taken into context with other factors and connections.

The knowledge gained in this research can be used to tailor government campaigns towards sustainability, used to offer more sustainability education starting from school and ending in universities. However, the problems here are that people lose trust into their government and that democracy is undermined by lobbyism and bureaucracy. A real paradigm change will be needed to achieve sustainability.
In addition, this research will help to improve models of sustainable societies. The given models and sustainability approaches usually do not target personal perception and human behaviour in the way it is needed. Messages towards sustainability are often not heard by many people and a major challenge will be changing behaviour patterns and personal perception towards sustainability. One important message is that people need to take care about other people and everybody needs to do something for the society to be successful. Unfortunately this behaviour is changed by consumerism and from this resulting greed. This behaviour change can be seen in many emerging countries where people start to lose old values replaced by material values. Again this necessary value change is only possible with a paradigm change in society – move away from consumerism towards a more social life.
Focusing on German SMEs there is a need to create trust within the company and to stop seeing employee's ideas as a thread. The involvement of all employees in important decisions and taken the ideas given seriously is the first step forward.
The largest challenges for German SMEs are their foreign markets which are also targeted by cheaper companies. Customers in these markets focus more on cheap product rather than on quality products which makes competition for German SMEs difficult. A solution could be the transfer and exchange of ideas rather than products which is suggested by many models of sustainable societies. One idea would be to adapt a kind of exchange model, where entrepreneurs in foreign countries can use the idea of the German SMEs to have a

business. In return the entrepreneur needs to pay a fee or trade in other ideas (further innovations, improvements).

The suggested strategies towards sustainability need to be backed-up by good knowledge about sustainability and necessary tools. Therefore education in sustainability at all levels (schools, colleges and universities) is needed which also supports social value change.

A change in social values and personal choice which takes the needs of society or community into account is urgently needed. The focus lies particular but not only on people with power and large financial resources which control enormous resources (Klein (2015)). This behaviour not only threatens sustainability but also the balance in a society.

It can be said SMEs can be more sustainable by implementing suggested measures but the society, which can be a customer, a politician who release regulations or an employee, need to change too.

9.2 Focus on Business Paradigm Change in German SMEs

SMEs will need changing the way how to do business. Since many German SMEs focus on foreign markets where cost pressure is high new approaches are needed. Future research could look into ideas and patent exchange or trade interests which could lead to less pressure and more sustainability. In addition global networking could also be a solution to the problems where more research is needed. However, networks can create larger organization which could use their bargaining power to follow only their interests without taking the society into account. Future research need to take this into consideration and suggest some control mechanism.

Another way to avoid the problems in foreign markets is franchise partners. This needs to be organized significant different as it is done now since franchise is often not fair and do not considers the needs of the franchisee or the society it is working in. A new more sustainable model is needed here to go forward. The difficulty is that both partners need to have a sustainable outcome which means this kind of business need to be carefully balanced. The problem here could one of the strongest factors influencing sustainability: personal rational choice.

Another point is the idea of PSS (product service system) which could be a solution for many German SMEs. Germany has still a strong industry and the service sector is relatively small in comparison to the UK. If a PSS can be implemented globally, suitable for foreign

markets or companies need to focus more on local markets could be the task of further research. However, if such a change is the way forward, employees need to gain new skills which should be connected to service. This would mean that education in sustainable service system need to be offered which need to be determined by future research.

Moreover, trust was one of the important factors researched and trust between employees and management is essential. This could lead to a culture change not only in SMEs but even in Germany. Trust and team building need to be trained and new values need to be offered to employees and managers. Working in SMEs could be based on family like values which could support sustainability provided the right knowledge is available. Here is another field for future research.

Finally marketing was identified as major obstacle towards sustainability. In addition, marketing in SMEs is often rudimentary due to lack of resources and knowledge. There are already ideas towards sustainable marketing, but the outcome of this research showed, that the majority of the attendees of interviews and questionnaire do not think this is working. Further research towards sustainable marketing is needed which takes SMEs and social value as well as the social dilemma into account.

9.3 Sustainable Society

This research introduced a model of a sustainable society which was used to find out if the attendees had any idea how future sustainable society could look like. Hardly anyone could imagine this model. One of the difficulties is that no way how such a sustainable society could be achieved and what kind of benefits the society as well as single person has, have been described. Most descriptions of a sustainable society do take the social dilemma issue account which is a major barrier for sustainable society. Future research need to define sustainable society in more detail, shows ways how to achieve it and, offer solution to overcome human behavior pattern which avoid sustainability. Furthermore, models need to develop which take the needs and the goals of SMEs into account. Managers need to understand the final goal and the way how to achieve it. In addition they need to see the advantage for themselves and their family by trying to achieve a sustainable society. SMEs as well as other organizations can only be sustainable if the big picture is understood.

Most sustainable educations, papers or articles focuses on something which is about to turn bad when no sustainable measures are taken place. Another viewpoint should be taken into

account by saying which good outcomes could be there if a sustainable society is achieved. This could be an interesting topic for another research.

9.4 Summary Future Research

This research showed many ways for further research as well as implementation approaches which are worthwhile to follow up. The focus is mainly on human behavior and changing it. In addition, social and personal values are important drives or barriers to sustainability which need to be research further. Many ideas are already developed, some of them not in the context of sustainability, which could help implementing sustainability. One example derived from this research would be trust building measures as well as education. Especially in education are many ideas which need to be research further which include determining needs and persuading people this knowledge is important for their and our future.
This research hopes that other researchers develop these ideas further and find ways how to implement sustainability in German SMEs and in society in general.

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Appendix A - Glossary of Terms

Term	Description
Cradle-to-Cradle	This framework seeks to create production techniques that are not just efficient but are essentially waste free. In cradle to cradle production all material inputs and outputs are seen either as technical or biological nutrients. Technical nutrients can be recycled or reused with no loss of quality and biological nutrients composted or consumed. By contrast cradle to grave refers to a company taking responsibility for the disposal of goods it has produced, but not necessarily putting products' constituent components back into service.
Cradle-to-Grave	From creation to disposal; throughout the life cycle. The term is used in a number of business contexts, but most typically in company's responsibility for dealing with hazardous waste and product performance. Same as "womb to tomb."
Green Products	Green Products are defined as follow: • Energy efficient, durable and often have low maintenance requirements. • Free of Ozone depleting chemicals, toxic compounds and don't produce toxic by-products. • Often made of recycled materials or content or from renewable and sustainable sources. • Obtained from local manufacturers or resources. • Biodegradable or easily reused either in part or as a whole.
GDP	Gross Domestic Product: The monetary value of all the finished goods and services produced within a country's borders in a specific time period, though GDP is usually calculated on an annual basis. It includes all of private and public consumption, government outlays, investments and exports less imports that occur within a defined territory.
Greenwashing	When a company, government or other group promotes green-based environmental initiatives or images but actually operates in a way that is damaging to the environment or in an opposite manner to the goal of the announced initiatives. This can also include misleading customers about the environmental benefits of a product through misleading advertising and unsubstantiated claims.
Institutional Theory	Institutional theory is "A widely accepted theoretical posture that emphasizes rational myths, isomorphism, and legitimacy." Institutional theory focuses on the deeper and more resilient aspects of social structure.
LE	Large Enterprise, at this research with more than 250 employees
Life Cycle Assessment	A systematic set of procedures for compiling and examining the inputs and outputs of materials and energy and the associated environmental impacts directly attributable to the functioning of a product or service system throughout its life cycle.

Marketing	The management process through which goods and services move from concept to the customer. It includes the coordination of four elements called the 4 P's of marketing: • identification, selection and development of a product, • determination of its price, • selection of a distribution channel to reach the customer's place, and • development and implementation of a promotional strategy
Meso Environment	The meso environment is the setting between the macro and micro opportunities. It shapes the framework of a business or organization and can be considered as its infrastructure: policies, standard operating procedures, rules and guidelines.
NIMBY	Not In My Back Yard; someone who opposes anything built right by where they live. NIMBYs cause a lot of things to not get done.
Product Service Systems (PSS)	Integrated offerings of tangible products, intangible services and the enabling infrastructure providing a product-unspecific functional value. While the user and the offering firm engage into an enduring contractual relationship, the ownership remains with the offering firm with the user becoming the temporary proprietor enabling a high use-flexibility.
SME	Small and medium size enterprises, at this research with up to 250 employees
Social Dilemma	A social dilemma is a situation in which an individual profits from selfishness unless everyone chooses the selfish alternative, in which case the whole group loses.
Supply Chain	A supply chain is the network of all the individuals, organizations, resources, activities and technology involved in the creation and sale of a product, from the delivery of source materials from the supplier to the manufacturer, through to its eventual delivery to the end user.
Sustainable Marketing	The process of promoting, selling, and distributing a product or service in a sustainable market in such a way as to educate customers of the multiple benefits of valuing human, economic, and natural capital.
Sustainable Society	A sustainable society is one that can progress without catastrophic setbacks in the foreseeable future. This focuses on economy, ecology as well as politics and culture.
TBL	Triple Bottom Line measures the company's economic value, "people account" – which measures the company's degree of social responsibility and the company's "planet account" – which measures the company's environmental responsibility.

Appendix B - “Greenwashing”

Tetra Pack

Tetra Pack is generally seen as good for the environment uses , has a small CO2 footprint, and is 100% recyclable. According to Benjamin (2012) this is just partly true. He stated that only 75% of the material is renewable. In addition 100% recycling is fairly difficult because the Tetra Pack is mad of a sandwich of cardboard and very thin foils of Aluminium and Polyethylene. According to the “Deutschen Umwelthilfe” (DUH) only 30% of the Tetra Pack material can be recycled. In addition, the “Umweltbundesamt” (UBA, environmental office) found out that the CO2 footprint is smaller than other one-way packaging but much larger than reusable packaging material. It seems Tetra Pack makes its product better, using marketing, than it really is. It is still better to buy mild or juice in a reusable glass bottle.

“Green” cars

Many actions of car manufacturers as well as government have the aim to get old cars off the street and buy new ones instead. It seems this is not very good for the environment even when the message has a different idea. According to Past (2009) this is just half of the truth. A Hummer H3 has not a larger footprint as the “green” Toyota Prius. Why is this? On the street the Prius ha a far smaller CO2 footprint than the Prius but it is regardless of the environment if the CO2 comes from the exhauster of the car or of the chimney of a factory. In this competition is the Hummer H3 the winner. The problem is the battery of the Prius. The battery contains Nickel which is toxic and the process of mining Nickel is very dirty. Battery and the electro motors of the Prius need as much energy for production as a complete Hummer.

The same problem can be found when an old car should be replaced by a new car. According to Past (2009) if an old Alfa Romeo (9 years old in 2009) should be replace with a Prius, it need 13 years for the Prius to break even the energy need of production and running a car. It seems the “green2 action only helps to increase the profit of the car manufacturer.

Appendix C – Ethics approval

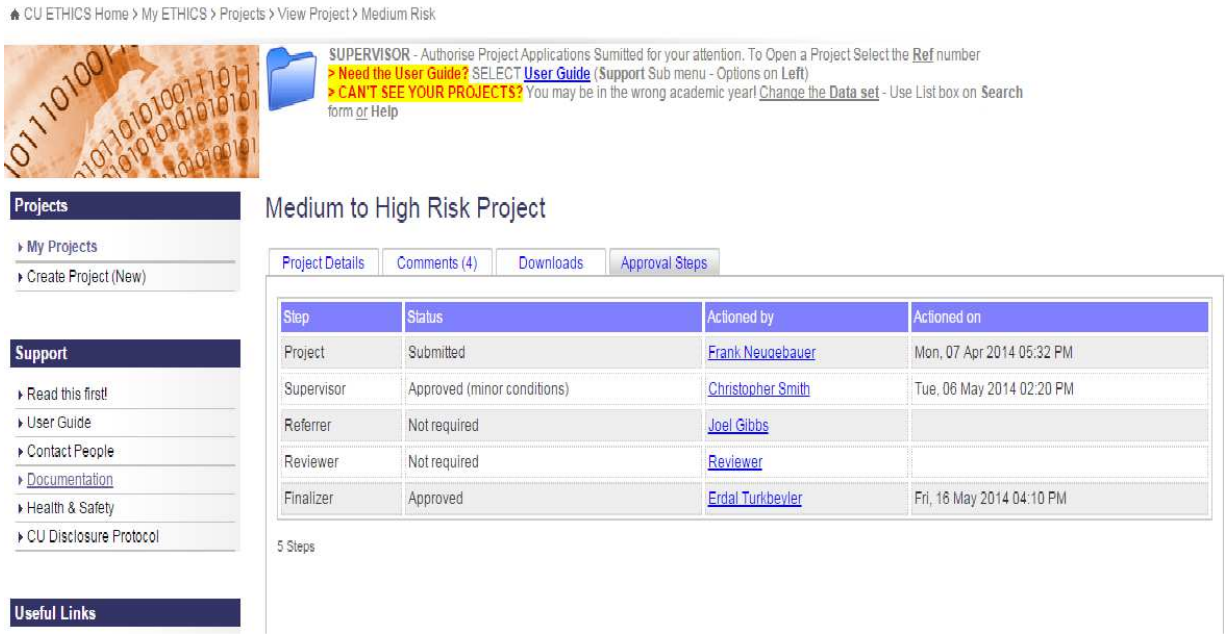

Figure 30: Ethics Approval P25997

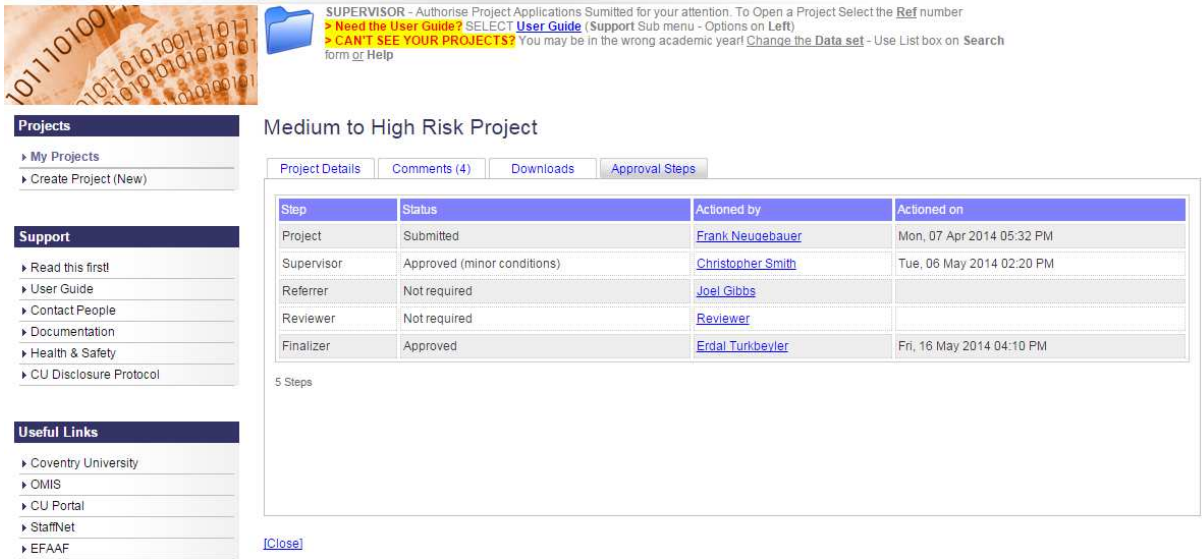

Figure 31: Ethics Approval P22656

Appendix D - Other strategically approaches towards Sustainability

The focus of this research lies on technology SMEs. The research has a short look to other approaches which could be of interest to answer research question 2. It is just an overview in order to avoid going behind the scope of this project.

Sustainable Engineering (SE) or Sustainable Engineering Design (SED) is an approach to implement sustainability issues into the engineering or designing process.

Hartley (1993) describes sustainable engineering as the confrontation with serious problems and upcoming disasters. Hartley went further and said if we make the right decisions disasters can be prevented which we have a choice. Additionally Hartley pointed out that Engineering has a great responsibility to help to make the right choices. Therefore engineers need to be fully educated and be aware of their responsibility. Engineering today is still developing a product which a company can sale as many as possible of. Some laws and regulations force companies to consider sustainability but the whole life cycle of a product is often not sustainable.

On the other hand Seliger and Kernbaum et al. (2006) looked at tasks like increasing the use of productivity of resources and expanding the lifetime of a product. This means resources are not depleted and the environment less damaged.

Davidson (2010) said today's engineers need to take social issues into account and cannot focus on technical challenges only. He also states that many engineers are not educated in Sustainable Engineering which means they are not effective in designing in a sustainable way. It is necessary to change paradigm in manufacturing and engineering.

Allen and Shonnard (2012) defined the goal of sustainable engineering as a challenge for engineers since they have to take into account material use, energy consumption, recyclability and many more in addition to traditional engineering tasks.

Seliger uses the term "Design for remanufacturing" and shows the possibilities on a mobile-phone which was design in a way that remanufacturing of parts of the phone is possible.

As one can see SD is an pool of different ideas, tools and approaches. The most important point is that SD has to take environmental and social issues and factors into account.

Closed-loop supply chain is an idea to close the life cycle of a product and its supply chain which was also the idea of the cradle-to cradle approach. According to De Giovanni and Zaccour (2014) a closed-loop supply chain in cooperates forward and reverse activity. This ideas include every step to create, supply, use, reuse and recycling a product and is therefore the holistic approach which is needed to achieve sustainability. They pointed out that the reverse part is the difficult one and customers need to have interest to recycle products in the correct way. Here they stated that buying back a product seems the most successful one. De Giovanni and Zaccour (2014) focused in their work on developing a remanufacturing approach for returned products.

Appendix E – Interview Questions

Top Management: Your position in the company?
Staff: Your position and daily work in the company and your responsibilities? How long have you been working in this company?

1. **What do you think about sustainability and what does it mean to you?**

Education

2. What is your education? Do you have any formal sustainability education or other training? Why did you do so?
3. Have your staffs any formal sustainability education? Is this education important for the company? Why?

Trust

4. Do the staffs have any input towards sustainable ideas? / Can you put your ideas regarding sustainability into the company?
5. Is your staff involved in sustainable decisions and which ways? / Are you involved into decisions towards sustainability? How?

Social Dilemma

6. How do you value sustainability in short and long term basis in terms of profit?
7. Can you sacrifice the profit over sustainability (especially investment decisions)?
8. Are company cars selected according status or environmental impact? Are business trip organised for convenience, costs or CO2 footprint?

Institutional theory

9. How does the external sustainability and social issues outside Germany affect your reaction towards sustainability (export and import of products)?
10. How does the external sustainability (go green) pressure in Germany like demands from customers or new laws and norms influence your reaction towards sustainability?
11. Do think sustainability is an important factor in Germany? Does the German society supports or hinder sustainability?
12. Are there any external or internal trends which encourage you to implement or not implement sustainable measures? Which ones?

Marketing

13. How does external advertisement and marketing influence sustainable approaches in the company?
14. Do you consider marketing as an important tool for sustainability and why?
15. How can marketing fit to sustainability considering customers?

Future Outlooks

16. How do you or would you implement sustainability in the company? Does LCA or Cradle-to-Cradle mean something to you? What is a sustainable product for you?

17. Do you thing sustainable business need to change or will change in the future? How will it look and what are the requirements for a transition? Which factors will be drivers for such a transition?
18. Given the scenario of a sustainable society: How would you do business within such an environment? What will be the company's strategies and goals? Do you think such a society can exist?

Connections

19. Do you think knowledge of sustainability and being able to involve staff/to be involved in sustainable decisions can support sustainability?
20. Can good marketing knowledge in terms of sustainability and the support of the society lead to sustainable business and society?
21. Can sustainable marketing influence personal behaviour towards sustainable choices and decisions in buying products and services?
22. Do think it is better to produce products where they are sold and used?

Appendix F - questionnaire

Survey Factors which influence sustainability

Note:
Participation in the study is entirely voluntary; you can withdraw from the survey at any point of time, without giving a reason for doing so. Please be assured that the information you provide will remain strictly confidential and anonymous. Answers will be reported so that no individual or organization will be identifiable from any publication presenting the results of the survey. By responding to the questionnaire, your consent to take part in the study is assumed and that you agree to the use of anonymized quotes in publications. If you would like to have further information about the project, please contact me via email (neugebaf@uni.coventry.ac.uk).

Questions with short explanations are cursively written in the text.

1. Location of your company (country): ……

2. Your position in your company: ……

3. Educational background …….

4. Number of employees in your company:

☐ 1-10
☐ 11-50
☐ 51- 100
☐ 101-250
☐ more than 250

5. What is your understanding in relation to sustainability?

This question will find out what you understand of sustainability and which parts, according to your understanding are part of sustainability. Please thick only two boxes which is closest to your definition of sustainability

☐ Environment protection
☐ Democracy
☐ Collaboration of society, environment protection and economy in order to be sustainable
☐ Living without compromising the life of future generations
☐ Resource efficient and environment protection as well as a social way of life

6. How to achieve sustainability according to your opinion?

Can you put your opinion in a scale 1-5, scale 0 being not relevant

☐ Purchase of *green* products
☐ Holistic approach taking culture, society, environment and economy into account
☐ Turning away from economic growth
☐ Not possible
☐ Development of sustainable products considering the complete life cycle

7. In which way is Sustainability in your company implemented and lived?

Please tick only one answer.
☐ My company has a strategy for sustainable practice
☐ Sustainability is not important at all
☐ Customers ask for sustainability
☐ Sustainability is not an issue for our work

8. Is education in your company in connection with sustainability important or not at all?

Please tick only one box which is the most appropriate in your opinion.
☐ Education in sustainability is important
☐ Education in sustainability is promoted
☐ Education in sustainability is recognized and is used within the company
☐ Education is not important at all

9. Collaboration within sustainability in relation to your company/How is sustainability promoted in your company in relation to teamwork & partnership.(that is to say does the company implement or take in to considerations sustainability promotions ideas or suggestions from the employees)

This question is looking into the involvement of employees in the company in terms of sustainability.
☐ Ideas from employees about sustainability are promoted and recognized
☐ Employees are involved in decisions regarding sustainability
☐ Employees are allowed to take part on decisions outside of their daily responsibilities
☐ Ideas are not promoted at all

10. Which of the following points are measures of sustainability in your company?

Please tick all boxes which are appropriate.
☐ Profit is above sustainability
☐ Sustainability is taken into consideration in investments
☐ Business cars are selected according to environmental impact
☐ Business trips are organized to be as short as possible (time)
☐ Others; please specify:

11. Which external factors influences towards your company towards sustainability?

You can tick all boxes which are appropriate.
☐ Problems of sustainability in export market will be considered by selecting ways of trading, selecting product or making businesses with companies which work according specific ethics to solve problems in this country.
☐ Customers influence sustainability in your company
☐ Your company implemented sustainability only if demanded by law

☐ Sustainability is important in your country
☐ The social environment (Society) supports implementing sustainability in your company

12. What are the influences of marketing in general towards your company in terms of sustainability?

☐ Sustainable solution approaches will be influenced by marketing in a positive or negative way which means marketing can support or hinder sustainability
☐ Marketing is an important tool in your company to achieve sustainability which means marketing is used as a driver to achieve sustainability
☐ Marketing is not sustainable to promote sustainability at all which means marketing cannot be used to achieve or promote sustainability in any way.

13. Sustainability in the future

How would you implement sustainability in your company?

_____

- Do you know Cradle-to-Cradle: yes ☐ no ☐
- Is Cradle-to-Cradle use in your company: yes ☐ no ☐
- Do you know LCA (life cycle assessment): yes ☐ no ☐
- Is the LVA used to determine sustainability for a product:

  yes ☐ no ☐

☐ Business practices will need to change towards sustainability
☐ A sustainable society is not possible

14. Factors which could influence sustainability in a positive way

Can you please tick the answers relevant to you, additional information can be added in the space provided.
☐ Only knowledge about sustainability will lead to implementation of sustainability
☐ Only personal persuasion in sustainability will lead to implementation of sustainability
☐ Knowledge and personal persuasion will lead to implementation of sustainability
☐ Globalisation is sustainable
☐ Others (please specify):

_____

15. Do you want to add any commend or explanation to this questionnaire or state more details to sustainability than please state here:

_____

Appendix G – Interview Data

The Committed

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C02; machine engineering	employee (E01)	works there since 2002 as hired labour force; development engineer machines	sustainability: environmental protection, resources efficiency, honesty towards customer (planned obsolescence); company just planning short term goals - profit; products long life, easy to repair, easy to recycle; private sustainability - long use of products, prestige product not needed, advertisement not interesting	sustainable ideas which costs money are not followed, short term results valuable	company uses sustainability to look good - internal no sustainability lived; hardly any influence of external marketing into company - cheapest offer is always taken; marketing could be used for sustainability; model influences could work	engineer combustion engines; no formal education to sustainability; promotion of sustainability education not done,	profit is more important than sustainability; company has a lot of external pressure - lowest price as possible, less orders, survival attitude; stable economy needed in order to act sustainable - opinion of top management; easy gaining of values is fashion and influences peoples decision	laws and regulation are followed not more; Germany lots of industry but no resources - should be sustainable - lots of pressure through cheap products; obsolesce by technical innovation should be checked by the government for sustainability problems, slower pace in technical innovations needed; lobbyism avoid democratic and sustainability	business strategies need to be changed in the future in order to survive; sustainable society hardly possible due to egoism and greed; transport need to be more expansive - less global exchange of products; sustainable product: no fashion products (moral obsolesce), robust long life products	education and personal perception need to come together, education alone does not causes sustainable behaviour; sustainability need to be always a foundation of every education;	product-life-cycles analyse not done because it is costly, cradle-to-cradle not known and not used
C05, machine engineering	Manager (M01)	Development Manager; works for 3 years	sustainability: environmental protection, resources efficiency, good reliable products; fair payment to employees; fair trading o resources taking sustainability into account; advertisement practice not	ideas towards higher profit are appreciated but not ideas towards sustainability which reduce profit or have only long term effects; staff has nothing to say to cooperate decisions	hardly any influence of external marketing into company, marketing is a sale tool and sustainability is only a marketing theme; marketing could be used for sustainability; creating of a model or culture could work to persuade	engineer mechanics; no formal education to sustainability but has attend some seminars; promotion of sustainability education not done, do not know any employee with a formal sustainability education	profit is more important than sustainability; external price pressure of Chinese products which makes it difficult to implement sustainability; most customers prefer the cheaper rather the better quality option; companies have to react to customer demands which are often not sustainable	laws and regulation are followed not more; slower pace in technical innovations needed in order to be more sustainable; sustainability in Germany gets more important but some industries (fashion) seems to be outside of sustainability movement; sees mainly trends in food towards organic products, small trend also in transportation	thinks business strategy of his company need to be changed in the future in order to be sustainable; less globalisation and more local products could be the way; sustainable society could be possible but very difficult to achieve;	sees education, personal perception and possibility to take part on decision processes in companies as well as private life as the important driver, sustainability need to be always a foundation of every education; lifestyles are heavily influenced by all kind of medias - need to change because often wrong	knows LCA but it is not used for sustainability in his company, knows also cradle-to-cradle and thinks it is a good idea for many but not all products

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
			sustainable; too many fashion products with short life		customers being more sustainable		at all			lifestyles promoted	
C11, electrical engineering	Manager (M01)	technical manager, works since 2005	sustainability is very important - environmental protection and economical use of resources; good work conditions for everyone; company could do more in sustainability but some action and measure already done; uses often bicycle, buys long lasting product where possible, has a low fuel consumption car and takes care about recycling	says that employees ideas are supported and taken seriously; ideas towards sustainability are taken into account; employees are involved in important cooperate decisions	thinks there are some influences from external marketing if its fits into the business scope new ideas from advertisements are welcome; not sure if marketing can be used as a tool to support sustainability - since customers should be influence to buy a product; there could be sustainable marketing for customer's needs, which provides detailed background info on sustainable issues - only possible if regulated	engineering degree; not formal education in sustainability but reads journals and magazines about sustainability; as far as I know staff has no formal education in sustainability - is also not supported at the moment	profit is more important than sustainability but some investments towards sustainability are made; thinks in some cases lower profit will be accepted if sustainable in the long run; company cars are selected according personal preferences but selecting a car with low fuel consumption is supported, business trips are selected according travel time	problem in sustainability in our export market are taken into account if needed; laws and regulations towards sustainability are implemented - if useful for company more is done, customer requests for more sustainability (so far not very often) are taken seriously and can lead to some actions; sustainability is a kind of fashion in Germany but it is not really balanced and often faulty - first customers support green products; thinks there are trends towards greener products	products need to be more sustainable by using sustainable resources where possible and design product for reuse or easy recycling - means a new company strategy; business practices will need to change in the future due to scarcity of resources; thinks similar sustainable society as introduce could be possible in the future	thinks involved staff with good knowledge could support sustainability in company; does not think that good knowledge in sustainability will also change marketing towards sustainability - is there an easier way to sell something it will be done; says that personal perception is more important than education to act sustainable but education is needed to act in a structured way	knows LCA and is used in company but only partly for sustainability; knows cradle-to-cradle and sees it as a possible tool for more sustainability for some products

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C01; machine engineering	employee (E01)	works as a clerk in customer service, works for company 14 years	- says sustainability is very important, is not happy because many things are not sustainable; thinks that sustainability is the way to live and to use products that environment gets not damaged in the long run, following generation will find clean environment; sustainability is absolute necessary	- does not know how ideas about sustainability are handled, sustainable behaviour not encouraged and not seen; does not know if employees are involved in decisions about sustainability	- influence of external marketing towards the company: thinks that influences are more unconscious, sees marketing as not supportive for sustainability; marketing could be important tool for sustainability - can influence customers in a positive way;	- no formal education in sustainability, own education A-levels; no known sustainability education in company, is not supported by company as far as known;	- not sure but thinks that sustainability is important but not over profit; is not aware in which ways company cars or business travel is organised	- influence of external problems abroad: does not know; demands of customers and laws: has influences but profit is very important; sustainability in Germany: thinks that many people do not think much about it - cheap prices or fashion is more important, but there are also people who live sustainable; trends: says trends do not influence her a lot, thinks for herself	- future implementation in company: strategy need to be change but nor sure if this will happen; - sustainable society: disadvantage for own company, sustainability not 100% possible but could be a good way for sustainability	- knowledge of sustainability: could be partly helpful for sustainability, many people do not see need for action despite knowledge, some people do not want to know; - marketing expert: thinks that knowledge about sustainability could change marketing; thinks that marketing can influence customers; products to build local: think it is partly possible	does not know cradle-to-cradle or product life cycle assessment
	engineers (M01)	consultant packaging application, 3 years member of IFCO, 25 years' experience, use of products or new application, projects with sales and marketing	sustainability: environmental, social and economic - compromise most often towards economic, we need to keep the world livable for our children, even disasters are used to generate profit, difficult to live sustainable - often not clear or fraud with products, intensive research necessary - often not feasible for common people - therefore I do within a few possibilities my part	- management would listen but direct experience, most decisions are economical, - involvement of staff only those which are directly affected, general projects did not happen so far	- influence of marketing: only low influence and in special departments, less interfaces of business to general public marketing; - marketing is manipulating people positive as well as negative, marketing is there to make profit, strong opinion of a person - less influence of marketing, critical review of a topic is not goal of marketing	- engineers for food technology and packaging, no format sustainable education; sustainability part of main education, knowledge often overruled by customer requests; - within company: does not know if staff has sustainable training and training is suggested by company	- business cars are given and connected to position, sustainability is not recommended by company, if than only by personal decision, management drives mostly large cars (BMW); - profit is target, sustainability only if no extra costs but is not sure if in the future the weighting can change, most decision are based on costs; - business travel only connected to	- social and sustainable problems abroad: does not know; - external demand influence into IFCO: go green more a marketing thing but no further external pressures also not from customers; - sustainability in Germany: important worldwide, sees other countries with more problems (China etc.), perception is mixed, habits often seen as sustainable but knowledge is missing which leads to unbalanced behaviour; - trends: no trend towards company. trends does not affect me - live according my values, save water and	- more sustainable strategy: how is current status - no sustainable strategies at the moment; - sustainable product: don't know to complex; - sustainable society: difficult to understand-model not very realistic, community work difficult because of specific labour division	- knowledge about sustainability: knowledge is not enough, personal perception has high influence; real knowledge too complex - but often people are often to lazy or not persuaded to do something - however knowledge could be foundation; - governments are not trustworthy therefore campaigns often fails because of bad reputation;- sustainability should be	LFA: need to be done extern, often research has focus to support own needs, to complex and difficult to do to be used, Cradle-to-Cradle not know;

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
							customer needs and time needed, no comparison between different travel possibilities	electricity, fights against fraud covert with go green campaigns, tries to takes social aspects when buying products into account		implemented into general school education; - locale product: as far as possible product should be local produced and sold, complex products traded globally (e.g. cars); global resources are needed - strong networks are in place	
C02; machine engineering	Manager (M01)	Manager Development, works there since 2009	resource efficiency, high availability of their machines; profitable work for customers - low running costs; private opinion - family is important	suggestions of employees towards sustainability are expected; cooperate sustainable measures - employees will be informed, particular departments will be involved if affected	advertising of sustainable or green products has hardly any influences of the company; marketing can also be used to promote sustainability;	engineer machine engineering, sustainability within the study; KPI - first steps towards sustainability	profit is always prior sustainability; if sustainable measure create higher costs without an immediate positive effect on profit - it will be refused, business cars selected by status, business trips - fastest option selected	sustainable problems in export market not relevant for marketing approaches and product as long as the product can be sold, law and regulation been followed but not more, sustainability in Germany is getting more important in the future,	no strategic sustainability measures to be implemented - more single actions form employees or departments - e.g. using environmental friendly detergent; strategies need to be changed in the future; future sustainable society - is possible	education alone nor enough, personal perception is also important - both is needed; sustainable product: low production costs (low energy use etc.); long life and complete recyclable; local manufacturing is better than global production	does not know cradle-to-cradle; knows product-life cycle analyse only done in technical perspective - sustainability not in focus

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C03, machine engineering	Manager (M01)	construction manager, works for 5 years	environmental protection, efficient use of resources, good quality products	employees could hand in ideas, if feasible ideas will be put into praxis, cooperate decision - staff get informed but cannot influence decisions	only small influence of marketing, does not see marketing as a tool to achieve sustainability, marketing is a selling tool	Maters of Science in Engineering, no formal education in sustainability; company does not support sustainability education nor looking for it	profit is usually prior sustainability; short term goals more important; business cars, business trips as well as office equipment chosen according position and costs rather than sustainability; just a few view long term goals followed - flavour of the month	sustainable problems in export market are taken into account if they support sales; law and regulations towards sustainability followed, anti-smoking program in company taken over from government actions; sees sustainability in Germany as important but mostly supportive in households rather than companies (export markets)	companies strategic towards sustainability need and will change; some smaller actions towards sustainability already shown, do not think sustainable society will exists as proposed - but can imagine kind of sustainable society could be created; sustainable product - long usage life, easy to recycle	education in sustainability is important but personal perception could undermine sustainability behaviour, influences from other people/society could influence sustainable behaviour positively as well as negatively	knows LCA but nor for sustainability; cradle-to-cradle not known
	employee (E01)	mechanics; works for 7 years	efficient use of resources, keep environment clean	ideas from employees for sustainability will be taken into account but mostly not proceeded; is informed about cooperate decisions but cannot say anything towards it,	cannot see influences of marketing towards the company; thinks marketing can support sustainability, positive messages towards sustainability possible; advertisements need to be more honest	apprenticeship mechanics, no special education in sustainability,	costs are more important than long term tools; cannot see that investments are selected according sustainability; manager get company car according their position	does not know if sustainability in export markets is taken into account; laws and regulations are followed as well as some government initiatives but not much more; is not sure if sustainability is important in Germany but sees rising awareness	thinks companies strategy need to change but does not know how; behaviour of every person need to change - less consumption, buying greener products; cannot imagine introduced sustainable society can exists	involving employees in sustainable decision could be a way forward; education and personal perception could change behaviour; is not sure if there is sustainable marketing; sees local products as important for sustainability	does not know cradle-to-cradle or product life cycle assessment
C04, machine engineering	Manager (M01)	Manager Marketing; works since 2009	sees sustainability as important to keep life standards; efficient use of resources and extensive recycling necessary; private life: tries to buy products with less packaging, recycles his waste as much as possible	employees have difficulties to forward ideas but sees change to more involvement of all staff; cooperate decisions are announced - so far mostly short term goals but first long term goals taken	thinks marketing is not only a tool for buying - can also be used promote sustainability; sees problems in honesty of advertisement; sees less influences of external marketing towards company - if influences often only flavour of the month.	business degree; no formal education in sustainability but visited a 2-day sustainability seminar; company has no interest in sustainability education	profit is more important than sustainability; sustainable ideas which will lower profit are not taken into account; business cars selected according prestige, business trip - fastest connection chosen	follows laws and regulation mostly but wont do anything more; if customer want to have green product - it would be done but no requests so far; sustainability seems to get more important in Germany - many people do not want to change their lifestyle; sees trends to save energy and by more	companies strategy need to change in order to survive in the long run; sees marketing as an important tool to implement and advertise sustainable measures and product; all people need to be aware of	thinks all employees need to be involved into sustainability decision - could be an advantage; marketing could be a tool to advertise sustainability but it is vulnerable to be used as sales tools again; thinks	knows LCA but nor for sustainability; cradle-to-cradle not known

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
				sustainability into account are announced as a plan				organic products (food)	sustainability and act accordingly; cannot imagine such a sustainable society can exists	local products as important for sustainability	
C05, machine engineering	employee (E01)	foreman tools; works for 12 years	sees environmental protection as important; recycling and separating of waste needed and important	ideas of employees are hardly taken inti account; cooperate decision are announced but no possibility to have a say	is not sure if external marketing influences his company; cannot imagine that marketing can be used to promote sustainability and therefore not suitable to reach customers in a sustainable way	apprenticeship tool maker; has nor formal or informal education in sustainability; do not know anybody who has a formal education in sustainability	thinks profit is more important than sustainability in his company; company needs to produce cheap due to external pressure; as far as he knows customers are not very interested in sustainability	company follows laws and regulation but slowly, does not know if company is doing more than needed; sustainability in Germany is important but many people leave action to others; does not know if there is a trend which supports or hinders sustainability	thinks the way of work need to change towards sustainability but does not know how to do; sees customer demand as an important driver for sustainability; sustainable society as shown could be possible but difficult	knowledge if sustainability is important but employees need to have the possibility to bring their ideas in and to be involved in sustainability actions; is not sure if marketing could play an important role in sustainability; local products could be step towards sustainability	has heard about LVA but never done; don not know cradle-to-cradle
C06, machine engineering	Manager (M01)	Managing Director; works for 10 years	sees sustainability as important to keep environment intact; economical use of resources; private life: tries to buy green products where possible, recycles his waste as much as possible	staff can forward ideas to their manager - if idea profitable it will be implemented, there are hardly any ideas towards sustainability; staff is involved in important cooperate decisions	sees only minor influences of external marketing inside the company; is not sure if marketing could be a tool to support sustainability but is maybe possible to target customers which want to buy sustainable products	business degree; no formal education in sustainability but attended some seminars for managers where sustainability was on the agenda; according to his opinion here are no employees which have a formal education in sustainability, it is also no need at the moment for sustainability education	mostly we chose short term profit over sustainability but we have a view investments in the long run which take sustainability into account; for most of our investments we would not accept higher cost only to be sustainable; only my car is a company car - it is a BMW; business trips	sustainability in issues in our export markets have only small influences unless it is a law or regulation or customer demand; we implement local laws and regulations and see if we can have some advantages from them, otherwise not more is done; thinks sustainability is important for a few groups in Germany; sees a trend in buying more organic products	not really sure how to implement sustainability into company but 100% recycling of product and sourcing sustainable resources would be start; due to lack of resources and changing customer demand he sees a need in strategy change	yes education in sustainability and involving staff into decision could help to implement sustainability - it is too early for this approach; thinks marketing could in the future support sustainability but not sure if misuse will spoil it; thinks personal perception is more a driver towards sustainability than education but	knows LCA and used it but not with focus sustainability, has heard from cradle-to-cradle but do not use it

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
							need to be cheap and fast			education would be helpful; not sure how a sustainable product will look like but thinks it need to robust and easy to be recycled	
C07, machine engineering	Manager (M01)	production manager; works for 7 years	sustainability is important with focus on reducing pollution and environmental protection (climate); sees also scarce resources as an issue; sees good family life as a sustainable way	staff will be involved in sustainability issues valid for their department, cooperate decision are not discussed with staff but staff will be informed	see only small influences from external marketing; does not think marketing could valuable for sustainability or any good for customers who wants to go the sustainable way	business degree; has no formal education in sustainability; company does not value any sustainable education	profit is definitely more important but in some cases sustainability is more important e.g. sourcing some resources only from countries which have reasonable work condition and environmental protection; business cars bought according position, business trips are arrange of convenience	export market is managed by an agency - if agency demands greener products or other sustainable measures we will follow; laws and regulations will be implemented; thinks sustainability in Germany is somewhat important and supports sustainability with some products - focus on food; trend towards organic products	thinks strategy needs to change slightly - less use of scarce resources and energy - reusable products would be a possibility for more sustainability; yes some business strategies will need changing in the future - will be influence by regulations, customer demand and availability of resources; cannot imagine the introduced sustainable society	involving well educated employees could be a way forward; thinks good sustainable knowledge could be misused in marketing to sell more than competition - only possible with regulations; thinks personal perception is the main driver; where possible products should be manufactured locally	does know LCA and uses it but less for sustainability; knows cradle-to-cradle but says it wont work with their products
C08, audio equipment	Manager (M01)	Senior Product Manager, work since 2012	Sustainably very important , but not to the company since profit is needed, no profit means no business and no employment for the people; privately recycles waste and uses often public	staff can forward ideas, if feasible they will be followed up, sustainability is an cooperate issue and staff has nothing to say	External marketing influences company's way forward, not company sustainable way of operation	Engineering degree, no formal education on sustainability	Profits most important, small companies cannot survive if they implement sustainable strategies	government and people are forced by business to behave the way it is, in terms of trend and laws which suites trends because of stiff competition from all around the world	standard rules, law, processes and regulation which MUST be implemented by all companies in the whole world in term of sustainability; introduced	education to all employees as well as customers could help; thinks education and personal perception are equal driver for sustainable	does know LCA and is used to follow up a products life cycle; does not know cradle-to-cradle

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
			transport						sustainable society not possible	behaviour; Local products could support sustainability	
C09, electrical engineering	employee (E01)	assistant vice president operations, responsible for service centre worldwide, acquiring of service providers, work for company since 1985	-saving resources, efficient use of resources, preserve earth for children: aware	- ideas from employees for sustainability - no practice for sustainability yet, believes ideas will be processed; cooperate ideas_ thinks employees would be involved in sustainability decisions but not sure in which way and to which level; example sustainability award (not won)	- influence of external marketing towards the company: would take good ideas in considerations but no example given; - sustainability and marketing; can support sustainability, positive messages towards sustainability possible; - view towards sustainable marketing: emphasize on advantages on sustainability, focus on local services and better product quality - thinks it is difficult to implement such an approach	-education: no special education in sustainability, A-levels and commercial apprenticeship; - in company education could be important but no topic yet, still a lot to do	- profit to sustainability difficult to judge, think that takeover of parent company leads to focus of sustainability, has no examples, investments focus on costs in employees department	- influence of external problems abroad: thinks has influences of companies strategy, demands of customers and laws: customer wishes will be fulfilled, laws and regulations not sure if done more than needed; sustainability in Germany: thinks it is known resource are limited and something need to be done, trends towards green, example e-cars,	- future implementation in company: persuasion of service provider to use sustainable technology (e.g.. Water plant, gas power stations), may saves cots, move extern with ideas (to external partners); - sustainable product: high quality product which last long and can be repaired, general more expensive quality products; - companies strategy in the future: company is on good way; - sustainable society: not sure if such a society could be exist, concern about external support, do not believe it is possible; companies strategy: focus on local transport and production	- knowledge of sustainability: in company - more information exchange and persuade employees to live sustainable, extern - more information needed, if info and knowledge is there, people would live more sustainable, - knowledge about sustainable marketing important; - products to build local: connection between regions - exchange of products; products which can be produced locally should not be important, needs to be critically reviewed	does not know cradle-to-cradle or product life cycle assessment

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C10, electrical engineering	Manager (M01)	service manager, works since 2003	do not see high importance for his company; thinks is doing enough in private life by recycling and leaving packaging in shops; sustainability is overrated but environmental protection makes sense	employees can bring ideas forward which will be discussed in the team - if feasible it will be implemented, hardly any ideas towards sustainability; employees will be involved in important cooperate decisions	cannot see any influences of external marketing into company but sees influences on their customers - changing demands; does not know if marketing can be used to promote sustainability; also not sure if there could be a special marketing praxis for green customers	state technician; no formal education in sustainability; knowledge gained form news and advertisements; do not thinks anyone has an education in sustainability in the company	profit is more important than sustainability; sustainability measure which will have no short term ROI won't be performed; cars and business trips are been selected according personal preferences (management) or costs (all others)	as far as I know we do not take sustainability problems in our export markets into account; customers do not ask for sustainability but we implement laws and regulations; it seems sustainability is kind of important in Germany but I cannot see drivers or obstacles from this; cannot see any trends	not sure how to implement sustainability in the company but I think there could be a need in the future; if customers demand green products strategies need to change; cannot imagine this kind of sustainable society	it is possible to get more sustainability if employees are involved and trained if needed (not in this company); not sure if marketing can be connected with sustainability; do not know if more knowledge will improve sustainability; thinks local products are better because they are produced in Germany	knows LCA but never used it for sustainability reasons, never heard about cradle-to-cradle
C12, electrical engineering	Manager (M01)	Managing Director; works for 16 years	thinks sustainability is important but mainly for environmental protection; lots of things towards sustainability already done like recycling or green products; sees his responsibility in recycling and buying greener products	staff can forward ideas and they will take into account; hardly any ideas about sustainability; cooperate decision are made without staff but staff will be informed	there are influences of external marketing into the company especially if there interesting products or services which supports the company; cannot imagine marketing could be an important tool for sustainability and therefore won't fit for customers who looking for sustainability	business degree; has no formal education in sustainability; staff has no formal education in sustainability and is also not supported	profit is more important than sustainability - focus is on short to midterm profit due to survival reason; sustainability only if low costs or some midterm ROI; business cars are selected by prestige, business trips are selected by travel time	external market are contacted by agency - no direct contact to external market therefore only measure which are demand by customers/agency will be taken into account; we obey laws and regulations and only do more if it fits into company culture; sees sustainability as reasonably important in Germany but supports only a few industries in sustainability; thinks there is a trend to purchase greener products	not sure how to implement sustainability in the company but thinks products need to be greener and less energy should be used; business practices will change in the future but not sure how; cannot imagine such a sustainable society will exists	does not see much sense in involving staff in sustainability issues; is also not sure if good sustainability knowledge will improve marketing since it is a selling tool; sees more personal perception as a driver for sustainability; local products could be good	does know LCA but not used for sustainability; never heard of cradle-to-cradle

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C13, electrical engineering	Manager (M01)	service manager, works since 2011	sustainability is important with focus on environmental protection and efficient use of resources; there needs to be still a lot like reducing consumerism; privately uses bicycle often, recycles products and buys often long lasting products	there is a scheme for putting down good ideas - these are discussed within the team and if feasible implemented - not many ideas about sustainability so far; important cooperate measure will be introduced and staff can add comments prior implementing	good ideas taken from advertisements and promotions are internally discussed - if good for the business it will be implemented/taken; not sure if marketing can be used to promote sustainability - at the end it is a sales tool; thinks that marketing (advertisement) is disregarded by people who think in a sustainable way	engineering degree; has no formal education but get info from internet and news; only one employees has attend a course about sustainability but education in sustainability is not really supported in the company	profit is generally more important than sustainability but there are some long term measures taken sustainability into account; usually a smaller profit in order to be more sustainable is not accepted; business cars are order according status of employee; business trips are selected by travel time	we follow regulations of external market as well as customer demands - sustainability problems need to be addressed by customers; we implement laws and regulation as fast as possible - will go behind the demands if advantage for company is given; thinks sustainability is important in Germany and supports partly sustainability; there is a trend for greener lifestyles	company's strategy need to change for more sustainability - products need to last longer and should be easier recyclable - more sustainable resources needed and sourced; thinks customer behavior need to change in order to run a sustainable business - maybe only possible with more regulations and education; cannot imagine such a sustainable society will exist	could be an advantage if employees are better involved and education to achieve sustainability; not sure if good knowledge about sustainability will change marketing - a paradigm change is needed; sees personal perception as the main driver for sustainability; local products will support sustainability	knows LCA which is also partly used to determine environmental impact of product; heard about cradle-to-cradle but don't uses it
	employee (E01)	service technician, works for 3 years	sees sustainability mainly as environmental protection; it is important to keep nature and reduce pollution; uses often train and leave car home; recycles his waste and tries to buy products with less packaging	ideas can be given to the manager - will be discussed later within the team but often not implemented; is informed about cooperate decisions and plans but cannot forward own ideas	do not thinks that detriments influences company a lot - will be kept mostly on a private level; not sure if marketing could be used to promote sustainability and is suitable for sustainability aware customers	technical apprenticeship; has no formal sustainability education; is not aware that colleagues have any formal sustainability education; gets his info from flyers and advertisements; company do not ask for sustainability education and do not support it	thinks profit is more important for the company; thinks lower profit is not accepted; business car is given by the company - selected for low investment and running costs; business trips are always done by company car	not sure if problems in export markets influence company; laws and regulation are implemented but not much more; customers do not ask very often for sustainability therefore it is not taken into account; thinks sustainability in fairly important in Germany and support a bit sustainability; sees a trend in buying more organic products	not sure how to change company's strategy towards sustainability but products need to be better quality and easy to recycled; thinks strategies need to change in the future; sustainable society will exist could be possible but very difficult to implement	involving staff into sustainable decision could be an advantage, more education is also good; not sure if good sustainability knowledge will change marketing; thinks knowledge is the driver for sustainability; local products are good and could support sustainability	does not know LCA or cradle-to-cradle

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C14, medical engineering	Manager (M01)	Technically Manager, works for 5 years	Sustainability very important from all points of view, being environmental, economic or social part of slow food club; believe that that everything has to take long to grow. Grow his fruits and vegetable	The top management only cares about returns. They do not have enough budget to implement the ideas given to the them	marketing as a tool can be good to sustainability only if it used properly, External marketing has a lot of influence on company sustainability decision and mostly is the negative one which does not support sustainability but only making money unsustainability by for example killing out plant by not recycle or reusing some of the parts of the company old products instead throwing them away since is cheaper to make a new product that to repair the old one	Master degree, has formal educations from his previous company about sustanabiliy.Collegues who has done BWL who are in top management say they have been taught how to make money from university, how? Sustainability was never mentioned.	In short profit very important to the company.	follows laws and regulations but not more; People goes with the trend- influenced by marketing and external factors like competition from other countries; some industries seems to be outside any regulations; sustainability in Germany needs to be developed	If the word profit in a sustainable way can be preached and practiced, sustainable strategy can be implemented and practiced; it might be a long way with struggle and with determination but can be archived; not sure how	Sustainable Marketing and teaching BWL people in university sustainable money making as a module for 3- 4 years depending on the length of the course	Have knowledge on cradle to cradle and LCA; uses LCA but only partly for sustainability
	employee (E01)	Technician, works since 2010	Believe that sustainability is like fashion to others; people does do what suite them in terms of sustainability. For example Go green. This is advertised by big companies but if you really look deep down or scrutinize their sustainability strategy you find that they are just doing that as part of trend, as they don't really don't care about other forms of sustainability, e.g. their canteen(the food is not regional, mass production food act.)	Middle managers listen to the ideas, are very eager to see something being done, unfortunately none of the ideas have been implemented.	The most unimportant and worst tools or way which kills sustainability.	Apprenticeship, has no formal education about sustainability, but read and learns about sustainable way of living from internet and other people; some of his colleagues have formal education about sustainability.	Management does not care about sustainability they care more about their bonus and the end of the year.	not sure if external market problems are taken into account; laws and regulations will be followed, Trend, every year they is a new trend of sustainability. They is no consistency, that is to say new trend means the old trend people forget about it and do not practice it anymore but put more energy of the new trend - trends are influenced by fashion rather than sustainability	everybody need practicing sustainable life style (not consuming mass production products for example) will be a better begging to sustainable future; strategies will need change	personal perception towards sustainability begins at home, then it will be necessary to spread, sustainability in companies.	has knowledge on LCA but do not use it

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C15, consumer goods	Manager (M01)	Production Manager, works for 8 years	sustainability is important for company in the long run; sees environmental protection and fair treatment and payment of all employees as most important; recycles waste and buys god quality products because they last longer; uses often a bicycle in his spare time	employees can jot their ideas down on a piece of paper and put it in the ideas-box - evaluation of the ideas once a week - often no ideas in the box and hardly any idea about sustainability; employees are involved in important cooperate decisions	external marketing could influence company - can give ideas about new products or features but not much influence towards sustainability; do not think marketing can be a tool to promote sustainability and therefore is not important for customers with focus on sustainability	engineering degree; has no formal sustainability education but some management seminars done which dealt with sustainability; as far as he knows only one employee has a formal education in sustainability; sustainable education is not promoted in the company	profit is more important than sustainability due to strong competition; less margins cannot be afforded; business cars are given by company and selected for low investment and running costs; business trips should be cheap	we export only within Europe where we expect similar problems than in Germany; laws and regulations are implemented but not more; thinks sustainability is getting important in Germany which can support sustainability; there is a trend towards greener products	implementation of sustainability in the company by designing products which are easy to be recycled; resources should be sources locally if possible; thinks there will be a need to change towards sustainability; not sure if such a sustainable society will ever exist	involving educated staff into important decision could help to achieve more sustainability - better sustainability education is needed; thinks marketing cannot be a tool for promoting sustainability regardless of knowledge; sees knowledge as a driver for sustainability; local products are definitely an advantage	does know LCA and is used to follow up a products life cycle - sustainability is only a minor issue; has heard about cradle-to-cradle but not sure about details
C16, consumer goods	Manager (M01)	Senior Product Manager, work since 2012	Sustainably very important, but not to the company since profit is needed, no profit means no business and no employment for the people.	The company is not in able to practice sustainability as it is a very small company and does not a have the budget for that and therefore does not take employees ideas into account; other ideas are welcome	External marketing influences company's way forward with product design and ideas but not company's sustainable way of operation	Degree in Engineering, no formal education on sustainability	Profit, profit, profit, small companies cannot survive if they implement sustainable strategies	trends are made by business rather than government and people are forced into consumerism, in terms of trend and laws which suites trends because of stiff competition from all around the world; sustainability is somewhat important in Germany but often spoiled by fancy ideas from government	strategy change will only happen when appropriate laws and regulation force company; strategy change need to be worldwide - otherwise disadvantage for those companies which implement sustainable strategy; no idea about the given sustainable society	Local products, standard sustainable way for all, education to all	does know LCA and is used to follow up a products life cycle; no idea about cradle-to-cradle

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C17, metal engineering	Manager (M01)	Senior Service Lead Manager, work for 10 years	Most importantly is to deliver products to the costumer on time a cheaper rate than the competitor; practice sustainability and home as in business is very difficult to practice.	Sustainability ideas are very welcome and the management hope one day they will be able to implement them.	sees some influences of external marketing; Marketing is not suitable to promote sustainability; there need to be regulations for marketing so it could support sustainability; people who want to live in a sustainable way avoid advertisement	master craftsman, None education in sustainability, but read a bit from the internet	Sustainability does not bring profit to the company.	We are fighting a losing battle as long as the different government or people are having a different opinion of sustainability.	government should reward sustainable way of implementing strategies, this could help small companies and this can work well; products need to have a longer life time - no fashion products	Education for all	has heard about cradle-to-cradle but not using it; use LCA but not for sustainability reasons
	employee (E01)	Support Technician, works since 2011	Sustainability very important but the practice is at home or in private life.	The company process does not involve sustainability, even if the ideas are welcome, nothing is implemented	Marketing only supports consumerism, very unsustainable; advertisements not very honest	state technician, No formal education on sustainability but read a lot about sustainability from books and internet.	Profit, and less cost.	laws and regulations will be implemented; Government and people only care about today, laws are made for today's way of life there is no tomorrow way of thing in terms of sustainability - therefore there is not relay sustainability in Germany	Management must care more about sustainability than profit - strategy change needed; more education needed especially for managers; hard to imagine that the given sustainability can exists but maybe possible but very difficult	honest and well explained laws and regulations which is equal all around the world could support sustainability; education is important but main driver is personal perception;	does know LCA and read about cradle-to-cradle
C18, metal engineering	Manager (M01)	Service Delivery Manager works for 5 years	sustainability is getting more important since many resources are scarcity; pollution in some countries need to be reduced; separates waste for recycling and buys low fuel-consumption car	company has a new idea-scheme where everybody can put down ideas; ideas are discuses on management level - outcome than discussed with employee; sustainability ideas are very rare	marketing influences some departments in company but less towards sustainability; marketing is not suitable for sustainability	engineering degree; has no formal education in sustainability, get some info out of industry magazines; not sure about education of others	cannot see that sustainability is more important than profit - profit is foundation of company's survival; small measures if sustainability are implemented; no personal sacrifice made (e.g. company cars)	implement laws and regulation but they often make business more difficult; do not react to problems of external market except customers demand it	thinks there will be changes towards sustainably management; no idea about a sustainable society	sees education by the customer especially in connection with marketing; education could be a driver	knows LCA but not in connection with sustainability; never heard about cradle-to-cradle

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C20, metal engineering	Manager (M01)	Service Manager work since 2009	sustainability is important but is the task of government and large enterprises rather small companies; privately uses green offers and waste recycling	employees can forward ideas to their managers - if profitable it will be implemented; no ideas about sustainability so far	do not think external marketing influences company a lot - maybe for new service or product ideas as well as company cars; not sure if there is a need to have sustainable marketing	state technician; has no formal education and is not aware someone has; sustainability education is not supported or promoted	for a small company sustainability is not that important but profit is; cost is the driver for most of the decisions	no contact to external markets; implement necessary laws and regulation but as late as possible; not sure about sustainability in Germany	does not know what should be change in the future; no idea about sustainable society	sustainable education and involvement not important for SMEs; not sure what the driver is	has heard about LCA but never used, no idea about cradle-to-cradle
C21, miscellaneous	Manager (M01)	Product Manager work for 14 year	sustainability is important and will get more important in the future; sees mainly problems with scarcity of resources and unbalanced wealth; environmental protection is good in Germany but in other countries still a lot to do; tries to by local products and separates waste	forwarding ideas is promoted and staff is involved in implementation of ideas; hardly any idea about sustainability	from a sustainability point of view government campaigns have influences to company but standard advertisement less; don't believe marketing could be sustainable and therefore suitable for sustainability customers	engineering degree; gets his knowledge from internet and magazines about sustainability; staff has no formal sustainability education but wishes more knowledge there; company does not promote such courses but would support	investment decisions are driven by cost and profit - there are some sustainability thoughts but not major; do not have company cars; business trips are cost sensitive	company implement laws and regulations and sees if there more advantages for company or staff; external markets only in Europe; thinks sustainability in Germany is important which is also a trend; lobbyism seems to avoid ar weaken sustainability in Germany	thinks designing of products need to change and material need to be easy to recycle; sustainable product is long lasting and easy to recycle; would be good if such a sustainability society could exist but not sure	involvement and education of staff is the key; education is driver but personal perception influences it; prefers local products	knows and uses LCA but less for sustainability analyses; heard about cradle-to-cradle but thinks it is not suitable for their products
	employee (E01)	Draughtsman; works for 10 years	sustainability is environmental protection which is important; problem is pollution and using nature as a resource; uses often public transport and recycles waste	ideas can be forwarded to the manager but often not followed up; information about cooperate decisions but no say	not very familiar with marketing but thinks advertisement is not sustainable	Apprenticeship , has no formal education about sustainability, knows what is in the media; colleagues have not sustainability education	thinks profit is more important than sustainability; does not have company car or doing some business trips	regulations are implemented; not sure if sustainability is very important in Germany but some positive trends exists	not sure what should change in the future; also not sure about sustainable society	would be good if staff would be more involved - could be an advantage; no idea what the driver is; local products are good for sustainability	don't know LCA or cradle-to-cradle
C22, miscellaneous	Manager (M01)	Management Director, works since 2009	sustainability is environmental protections and fairness; focus lies on saving resources and recycle all products; buys green products and recycles waste	employees are involved in company decisions and bring ideas in; sustainability ideas are rare so far	thinks there are some influences form external marketing but it is difficult to define; sees marketing as sales tool rather than a marketing tool; marketing for sustainability customers need to 100% fact based - only possible with regulations	business degree; no formal sustainability education but there was some sustainability teaching during degree study; staff has no formal education and it is not promoted at the moment	profit is more important but some sustainable measure are taken into consideration, cars bought according personal preferences within given limits; business trips need to fast	external problems are taken into account especially if there is a customer demands; laws and regulation are implemented - not much more done so far; not sure if sustainability is important - gets different signals but there seems to be trend towards sustainability	strategically changes are needed - product design and sourcing of resources will be major changes; sustainable products need to be upgradable, reusable and easy recyclable; sustainable society seems not realistic	involving staff in internal company decisions useful; education is useful too and sees it as a driver but personal perception are also important; thinks local products are a way forward to sustainability	knows and uses LCA but less for sustainability; thinks the cradle-to-cradle idea is for some products a good approach

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C23, miscellaneous	Manager (M01)	Station manager works since 2003	recycling wastes at home; use public transport to come to work, and exchanges product and get something in return (e.g. clothes to get potatoes)	company implements some of the employees idea e.g. repairing most of equipment where necessary even if it sometime cheaper to buy new equipment than repairing.	marketing has some influence in some company decisions which is not good for sustainability.	Degree in Engineering and BWL , has formal education about sustainability, knows what is in the media; some colleagues have sustainability education	Profit is the killer of sustainability; no sustainable measure taken into account; fierce competition from China we have react to	Germany's government is bowing to the pressure of external factors from other countries as a results - sustainability regulation not good enough to bring change	strict rules and regulation from the government should change in the future; have not lost hope in sustainable society only if the government put weight on that.	would be good if staff would be more involved - could be an advantage; local products are good for sustainability	have ideas on LCA and cradle-to-cradle

The Indifferent

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C19, metal engineering	Manager (M01)	Product Manager work for 4 year	sustainability will be very important in the future but has less importance now; something already done like waste recycling;	company is valuing employees idea but ideas about sustainability is not needed; cooperate decision will be done by top management, employees will be informed	not sure what marketing has to do with sustainability but do not see any influence to the company	academy diploma; cannot see why education in sustainability could be of need in the company	obviously profit is the point, no profit no company	we follows laws and regulations not more	not sure if strategies need to change; sustainable society is science fiction	no opinion about education and personal perception; do not know much about marketing	has heard about LCA but no ideas what cradle-to-cradle is

company		role and task in company	general attitude towards sustainability	Trust within company	Advertisement, Marketing	Knowledge and education	Social dilemma – personal rational	Political and institutional values	future views	connections	tools
C09, electrical engineering	Manager (M01)	technical manager; works for 3 years	could be important in the future but at the moment it is done enough; buys mostly high quality products which last long, also recycling is important	employees can put ideas forward but sustainability is not major on the agenda; employees will be informed about cooperate decision but not involved; thinks sustainability action with involvement of employees not that important	see some influences of external marketing in company especially by company cars, office and kitchen equipment - not too much influences to the core business; cannot imagine marketing could be used to achieve sustainability; maybe customers who wants to buy green products could be target group for marketing	engineering degree, does not have any formal sustainability education, gets his knowledge from news and internet; is not aware that other colleagues have any formal sustainability education	profit is more important than sustainability at the moment but sustainable measures are often in place; no lower profit is not a good exchange for sustainability; business cars and business trips are selected by personal preferences, costs and speed (trips)	we take sustainability problems in our export markets into account especially when customers demand it; we follow laws and regulation - more only if it fits in our cooperate strategy; thinks sustainability is important in Germany but support sustainability only in a few industries; does not see any trend at the moment	thinks strategies need to be adapted to sustainability demands in the future but see customers demand as an important factor, sustainable strategies and business need to be implemented worldwide otherwise sustainable business will have disadvantage; do not think such a sustainable society will be possible	it would be better to have specialist for sustainability rather than involving all employees - some ideas could be worthwhile; see good education as the main driver; local products will support sustainability	has heard about cradle-to-cradle but not 100% sure what is behind that idea; know LCA has done it including some sustainability aspect - full LCA taken all sustainability factors into account is too expensive